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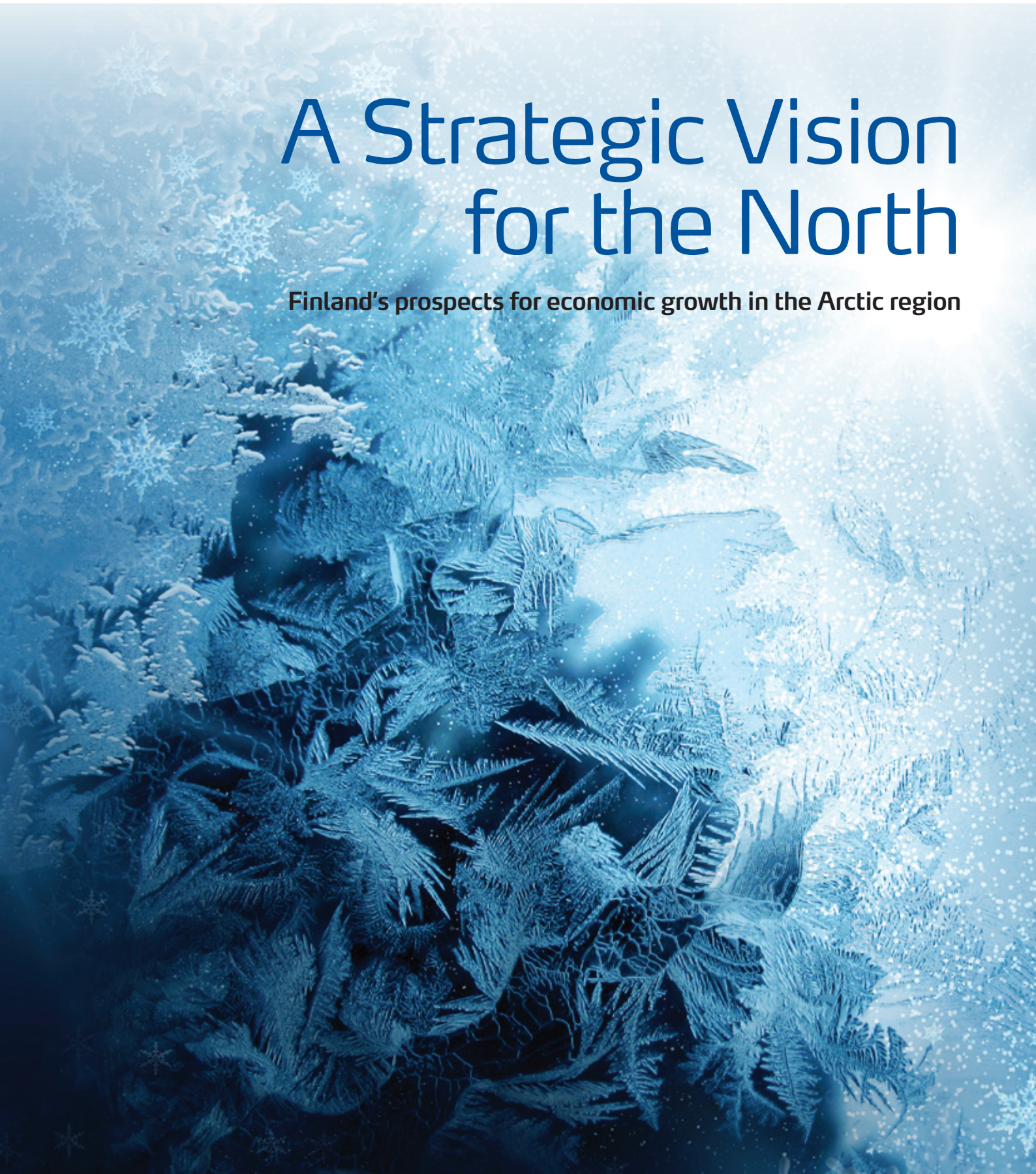
Confederation of Finnish Industries

A Strategic Vision for the North

Finland's prospects for economic growth in the Arctic region



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Summary

This report on Finland's prospects for economic growth in the Arctic and Northern regions was commissioned from Finland's former Prime Minister Paavo Lipponen by the Confederation of Finnish Industries EK, the Finnish Energy Industries, the Finnish Chemical Industry, the Finnish Hospitality Association MaRa, the Confederation of Finnish Construction Industries RT, and the Federation of Finnish Technology Industries, as well as the funding organisation TT Foundation.

The Arctic region can develop into Europe's largest area of investment. It is estimated that investments worth about EUR 140 billion are planned in the Barents region alone. Finland now has a window of opportunity to ensure that we will get our share of northern economic growth.

Now that the 'Arctic hype' has evaporated, it is possible to assess business opportunities in northern regions more realistically, and the potential is substantial. Finland will have a wide range of opportunities in the sectors of industry, energy, cleantech, logistics, infraconstruction, as well as tourism and other services.

The Arctic growth opportunity may, however, slip through our fingers unless the state and the business sector can together determine the key goals of our northern policy. It is equally important to commit ourselves to the action plan that determines the responsible actors, contributors, and follow-up.

Recommendations regarding Finland's strategic vision for its Arctic and northern policy during the parliamentary term of 2015–2019:

1. **The Prime Minister's leadership in decision-making concerning the policy for the Arctic and northern regions will be strengthened. Coordination and follow-up of northern matters within the administrative sector will be improved.**
2. **Finland will aim to take on a leading role in the EU's policy on the Arctic and northern regions.**
3. **The role of enterprises in drafting the northern and Arctic policy will be strengthened. Companies from all regions in Finland must be engaged in this policy making.**
4. **Finland will define a clear strategy for promoting infrastructure projects that are important to us within the EU. The accessibility of Northern Finland from the perspectives of industry and tourism will be improved.**
5. **Finland will become a global hub for logistics, telecommunications and big data.**
6. **Cooperation between the Nordic countries will be intensified in the field of energy under the leadership of the state authorities. The Nordic countries must strengthen their competitive position and actively influence the development of the EU energy market.**
7. **Deterioration of the language skills of Finnish people must be prevented. In particular, learning of Swedish will be reformed so that the Nordic labour markets can be effectively utilised.**
8. **A joint programme will be drafted at the prime ministerial level to remove cross-border barriers between the Nordic countries.**
9. **Northern universities will be strengthened while developing cooperation between them. One Arctic university, capable of competing internationally, will be set as a goal.**
10. **An information centre will be established to serve companies, tasked with producing information on projects and providing advice especially in the tendering and kick-off stages.**

1 Introduction

The Arctic region has become the centre of global change over the past few decades. There are three primary reasons for this: the significance of Arctic natural resources has grown, awareness of the sensitivity of the Arctic environment is better than before, and the return of geopolitics also concerns the Arctic region.

Projections concerning the Arctic region and the exploitation of its natural resources reached a fever pitch in the early 2000s. Great opportunities were seen in offshore operations and especially in the exploitation of the oil and gas reserves of the Barents Sea. The countries of the region and the European Union, as well as many of the EU member states, drew up an Arctic strategy or a similar programme.

The oil reserves in the Arctic region are estimated to last until the end of this century, gas reserves even for 300 years. There are great mineral reserves in the north: the deposits are among the richest in the world. Technological development may provide new opportunities, such as extraction operations on the sea bottom. Marine food production – fishing, fish farming, algae farming – is growing rapidly in the north, and is of global significance. In tourism, the growth outlook of utilising global traveller flows is good. The Arctic region offers experiences for travellers over different seasons. Asia and Russia pose great opportunities for Finland in Arctic tourism.

The Arctic region, especially Norway and Russia, can develop into Europe's largest area of investment. The estimated value of different project plans known in the Barents region is about EUR 140 billion. Norway has active investment activity especially in infrastructure, services and research. This means huge construction operations. Exploitation of oil and gas reserves in the Norwegian continental shelf, including opening new fields, is progressing to plan.

Russia focuses on utilising the onshore reserves in the Yamal area. The building of LNG plants in Yamal, as well as great investments in the infrastructure in the Murmansk–Archangel areas, may provide opportunities for Finnish expertise: roads, ports, mines, research, and services. There is a great need for construction.

The natural resources of Greenland, such as minerals, are attracting great interest in, e.g. China. Environmental aspects and the rights of indigenous people are taken into account in the exploitation of these resources.

Russia is developing the Northeast Passage, e.g. by building maintenance bases on the coast. The move of global sea transportation to the Northeast Passage requires round-the-year navigation, which may be possible in 20–40 years. If this comes true, the development outlook for northern logistics will see a fundamental change also for Finland.

The utilisation of Finland's Arctic position may support the development of our country into a centre of global logistics and a link between Asia and Europe, as Russia's neighbour. A fibre optic cable connection from Europe to Asia via the north would play a significant part in this kind of development.

The cold conditions provide excellent opportunities to establish data centres for global enterprises. Finland's utilisation as a transport route for Arctic fish products will also reinforce its logistical position. In transport and other logistics, development of the north-south connection with EU support is essentially linked to utilising the opportunities offered by the Arctic region as the key investment area in Europe.

Some global trends have somewhat dampened Arctic expectations in the past few years.

- The price of oil, as well as that of gas and minerals, has fallen significantly as the growth is slowing down globally and especially in China. Major producers in the Middle East have increased the supply of oil in order to safeguard their market share. Oversupply of oil has cut investment plans in the field by about a billion dollars.

  The price of gas has also fallen as a result of diminished demand and growing supply, albeit to a clearly lesser extent than that of oil. The falling price of minerals restricts the utilisation of new discoveries in the north.

- The return of geopolitics and the accelerating power struggle between major economies and alliances have an impact on the outlook of the Arctic region.

  The significance of military policy in the Arctic region has grown as Russia is strengthening its network of strongholds close to the Finnish border and in the Arctic regions in the Far East. In the Nordic countries, also in Finland, the new military policy setting will probably lead to strengthening of defences in the north.

- The awareness of the vulnerability of the Arctic environment and its significance in climate change is gaining strength little by little. It can be seen in the strategies of Arctic nations and other actors and, increasingly clearly, when the companies operating in the region plan to exploit Arctic natural resources. This issue is also related to increasing amount of environmental lobbying by non-governmental organisations.

- The countries in the Arctic region and the international community recognise the economic and cultural rights and self-determination of indigenous peoples in the Arctic region even more clearly than before. This has an impact on business planning especially in the extractive industry and in infrastructure projects.

- The development outlook of transport and logistics in the Arctic sea areas and especially in the Northeast Passage has deteriorated as the global economic growth slows down and the Arctic conditions prove to be more difficult than expected. The geopolitical setting also creates uncertainty in the utilisation of the Northeast Passage.

- Demographic forecasts indicate that the population will become older and the number of working-age people will fall significantly in many countries in the Arctic region over the rest of the current century. Especially the availability of professional workforce has turned out to be a problem, e.g. in northern Norway.

Arctic business activities can be planned more realistically because megatrends, such as environmental issues and climate change, are taken more seriously than before. Changing of the Arctic outlook does not mean that the business opportunities in the region have crucially diminished. On the contrary, there are immense long-term business opportunities especially from Finland's point of view. Investments by Norway and Russia in the Arctic region are part of a long-term policy. The exploitation of Arctic natural resources has only just begun.

Despite the culmination of the geopolitical setting, the countries in the region aim to keep Arctic cooperation, especially its institutions, outside the juxtaposition. The Arctic Council has approved the oil pollution prevention and response agreements and, as a result, it has become a regulator. Cooperation in the Barents Euro-Arctic Council continues. Nuclear waste cooperation in the Northern Dimension Environmental Partnership in North-West Russia has been excluded from sanctions. Coastal countries in the Arctic region, Russia, USA, Norway, Denmark and Canada, have shown moderation in the bilateral relations in the Arctic region despite each of them in turn making demands concerning the continental shelf. Russia's 'responsible' conduct in Arctic cooperation has been noted in the West.

The Russian situation is now expectant but, nevertheless, Finnish exports will have new opportunities in the Arctic region from Murmansk to Yamal. There is a great need for cooperation in the development of transport links. If and when the cooperation between Russia and the West is restored or at least some of the sanctions are lifted, Finland and Norway are in a good position to take advantage of Russian export opportunities.

The Arctic states, such as Norway, Russia and USA, will increase their investments in research and development activities. The University of Tromsø already has international significance. Cooperation continues in the networks of Arctic universities and research institutes, and Finnish universities play a key role in these networks.

Finland has great opportunities in the Arctic region

Finland is an active player in the Arctic region. Our country has an Arctic strategy and the related preparatory bodies, such as the Finland Arctic Advisory Board. Enterprises are showing an increasing amount of interest towards the utilisation of Arctic business potential.

The President of the Republic of Finland has promoted Arctic cooperation especially with Norway. The Prime Ministers of three Nordic countries, Finland, Sweden and Norway, have commissioned a key report 'Growth from the North'. Raising Arctic operations to a new level has good possibilities. These possibilities must be utilised in the new parliamentary term, taking account of cooperation between the government and industry in sustainable utilisation of Arctic business potential.

The north has great growth potential. Gaining investments, both public and private, in the northern areas will benefit Europe as a whole. Finland is offering a safe and positive alternative to investment now and in the future. We also have a chance of gaining from the development of our neighbouring countries.

The Arctic and northern policy can be the spearhead of Finland's growth policy. The northern business and market opportunities for industry must be seen as part of the global market. The northern policy plans must therefore be drafted on that basis.

Finland also has vital interests to safeguard in the north in the form of security of supply and energy security. In terms of security policy, it is of vital importance to ensure Atlantic transport connections.

The change in the geopolitical situation will probably lead to the strengthening of Finland's defences in the north. The developing cooperation with Sweden can be utilised in this.

The north is among the energy-richest regions in Europe. The Nordic energy resources and solutions complement each other. The energy markets of the Nordic countries are significant, taking account of the climate and energy-intensive economy. With the exception of the Norwegian oil sector, the Nordic energy companies are small in relation to their European competitors.

The states are responsible for energy security, the implementation of international climate targets and reaching the energy targets set by the European Union. As the EU preparation progresses, the Nordic countries must strengthen their negotiating positions by tightening their cooperation. This matter needs political will and initiative.

The political decision-making and business operations come together in the Arctic region. It is in the interest of every actor to know which regulations, policies and schedules can promote economic and business projects. Project implementation needs help in exports and strategy, and the states play an important part in this.

Finland's Arctic policy must form a stronger strategic intent than at present, including tightening cooperation between the government and business life. The leadership position of the Prime Minister must be reinforced and the preparation of strategies improved, and their follow-up must be organised in an effective way.

Finland has limited resources in the utilisation of northern business opportunities. The northern policy must be national, involving companies throughout the entire country. Efforts must be made to eliminate separatism between regions. The northern provinces and their centres and universities play a key role in the development of the Arctic policy.

Finland must strive for leadership in northern policy in the EU. The current setting in the EU centres around the south, but the entire union would benefit from a northern growth engine. Raising the north to the spearhead of the EU agenda requires cooperation with the other Nordic countries.

A strong strategic intent in Arctic and northern policy

Despite diverse Arctic activity by the government and industry, Finland's Arctic policy is still seeking its focal areas and clearer leadership. Cooperation between the government and business life requires development. The purpose of this report is to highlight the opportunities offered by cooperation. In the new parliamentary term of 2015–2019, the contribution of business life in the preparation of Arctic policy must be boosted.

The government and industries must together define the key targets of the Arctic and northern policy and create a strong strategic intent for their implementation. These targets must be included in the government programme. To implement them, we need an action plan that also defines the responsible actors, contributors and follow-up of projects.

This report deals with the Arctic and northern policy in its entirety – from decision-making by international cooperation bodies all the way to the services provided by SMEs. The report explains the background of, e.g. international development. It also includes a number of detailed presentations.

To increase the efficiency of Arctic and northern policy, we must set up spearhead projects and targets to be included in the government programme.

Recommendations regarding Finland's strategic vision for its Arctic and northern policy during the parliamentary term of 2015–2019:

1. **Decision-making in Arctic and northern policy shall reinforce the Prime Minister's leadership and improve coordination in northern matters and their follow-up in administration.**
2. **Finland will aim to gain a leading role in EU's Arctic and northern policy. The EU must improve leadership in Arctic and northern policy. The EU must improve leadership in Arctic and northern policy.**
3. **The role of enterprises in drafting the northern and Arctic policy will be strengthened. Companies from all regions in Finland must be engaged in this policy-making.**
4. **Important infrastructure projects for Finland will be boosted in the EU on the basis of a clear target setting. Drafting of TEN-T projects and promoting them in the EU bodies must take place at an early stage also at the political level. Northern transport projects will be prioritised. Building of the E8 road link between Tromsø and Skibotn and Kirkenes in Norway will be raised as the most important project in the near future. Accessibility of northern Finland from the perspectives of industry and tourism will be improved by developing connections to Asia and in the east-west direction in the north.**
5. **A northern cable project to Asia via Finland will be implemented. Finland must be built into a hub of global data traffic, data storage and big data business. This must be raised as a national strategy that also combines different administrative sectors.**
6. **Cooperation between the Nordic countries in the field of energy will be intensified under the leadership of the state authorities. The Nordic countries must strengthen their competitive position and actively influence the development of the EU energy market.**
7. **Learning of Swedish in cooperation with the government and enterprises will be strongly promoted in order to utilise northern labour markets. Deterioration of language skills will be prevented by reforming language studies.**
8. **A joint programme will be drawn up at the prime ministerial level to remove cross-border barriers between the Nordic countries. Progress through small steps will be abandoned.**
9. **The profiling of northern universities, division of tasks and cooperation will be strengthened with a target of a single Arctic university capable of competing on the international scale.**
10. **An information centre will be established in the north, serving businesses in the entire country in partnership with the public and private sector. The task of the information centre is to produce information on projects and to give advice especially in the tendering and kick-off stages.**

2 Administrative and political decision-making in Finland

Finland must give out a clear message on its preparedness for action and its expertise. This includes raising the status of northern issues, coordinating and centralising the management of issues, influencing attitudes, and encouraging new projects.

It is important for the success of business operations and project acquisition to have appropriate political administration. The policy of northern areas is managed in different ministries, and their work must be coordinated comprehensively. The management arrangement will send out a political message that the government is well-equipped to carry out northern policy.

The leading idea of Finland's Arctic strategy is to make Finland a forerunner in the Arctic region in the areas of sustainable development and sustainable business operations, taking into account the economic and social issues. The commercial dimension of Arctic partnerships is important to industry.

Development programmes that reach beyond parliamentary terms must be achieved in northern policy. Northern policy is a challenging activity that reaches across borders and sectors. The update of the Arctic strategy must be brought forward from 2016.

Arctic and northern issues are managed by several public administration sectors. Key coordination groups for Arctic policy are the Finland Arctic Advisory Board (Prime Minister's Office), the working group of permanent secretaries (Prime Minister's Office / Ministry for Foreign Affairs) and a network of officials (Ministry for Foreign Affairs). In addition, Arctic and northern issues have been dealt with in government meetings and evening sessions and in the Cabinet Committee on Foreign and Security Policy.

To carry out a comprehensive policy, the government must have one body with an overall management responsibility (Prime Minister's Office). The substance ministries are responsible for driving the matters forward. The Arctic Advisory Board is led by the state secretary in the Prime Minister's Office. The advisory board is responsible for monitoring Finland's Arctic policy and promoting its coordination.

The group of permanent secretaries of the ministries (MEE, MoD, MoE, MoTC, MFA, PMO, MEC) meets on a regular basis. The state secretary of the Prime Minister's Office acts as the responsible coordinator. Responsibility within the ministry lies on the minister – permanent secretary – responsible official line. The role of the group of permanent secretaries is examining issues, monitoring progress, implementation and gaining added input in Arctic issues.

Based on feedback from Finnish industry, there is rigidness in Finland and Finnish administration in relation to Arctic and northern issues. Policy and strategy preparation is slow, and this poses a challenge to business.

Administration must be proactive in relation to future EU funding decisions and TEN projects. We must use these decisions and projects to ensure that Finland's logistical and other interests are safeguarded in the north, as is the transport connection to the North Atlantic and the Northern Sea Route.

Government

Finland's Arctic and northern policy is led by the Prime Minister as a multi-administrative activity. In order to ensure political strategic intent and to boost follow-up, the government must meet in its entirety every six months in a special northern policy meeting with reporting by the responsible ministries. This procedure maintains the strategic intent of northern policy and ensures monitoring of the implementation of decisions. Northern issues are also dealt with by the Cabinet Committee on Foreign and Security Policy, the Cabinet Committee on Economic Policy and the Cabinet Committee on European Union Affairs.

Prime Minister's Office (PMO)

The main task of the Prime Minister's Office is to support the Prime Minister and the government in the planning of the government functions and related decision-making. Coordination of northern policy is part of the tasks of the Prime Minister's Office when the matter is prepared in the substance ministries. The Prime Minister leads the policy on Europe and the northern policy. However, the current resources of the Prime Minister's Office do not stretch to the coordination of northern issues. The office needs a sufficient resource of officials under the state secretary to manage the coordination.

Ministry for Foreign Affairs of Finland

Finland must boost northern policy activities both in the European Union and in international organisations and bilaterally. This requires, e.g. harmonisation of northern policy management (various councils, northern dimension) in the Ministry for Foreign Affairs.

The European Commission (including the European External Action Service EEAS) must develop coordination of northern policy.

President of the Republic of Finland

Foundations for bilateral Arctic partnership between Finland and Norway were laid during the state visit of President Sauli Niinistö to Norway in 2012. The partnership is promoted through bilateral consultations between officials, aiming for concrete benefits and commercial opportunities. In addition to Norway, Finland has a bilateral Arctic partnership with Russia.

Through the visits and meetings, President Niinistö can promote key Arctic and northern issues in terms of the business sector, as during his state visit to Canada.

Cooperation between government and industry

The government and industry must jointly record the northern targets, taking account of different sectors of industry. In terms of the government, the matters are recorded in the government programme. The business sectors aim to gain projects with a common interest and in which the state's involvement is essential. The state's role is emphasised in infrastructure and preparatory measures, as well as in various public services.

Finland's next Arctic strategy must promote entities. The business sector must be represented more extensively in the Arctic Advisory Board. Selected projects must be promoted together.

Arctic and northern issues must be raised to the national policy level if the related business opportunities are to be exploited. The Arctic and northern policy must be developed in close cooperation with the population centres in northern Finland, regional administration and in provinces, and by universities, research institutes and business life. The Sami population and non-governmental organisations must be included in decision-making.

Arctic administrative areas

Source: Arctic Council / Winfried K. Dallmann, Norwegian Polar Institute

3 Governmental and industrial partnerships

International institutions

Arctic Council

The position of the Arctic Council has been reinforced by internationally binding agreements on oil spill prevention and rescue operations. With these agreements, the Arctic Council has gained a position of regulator for the first time. The main regulator is still the International Maritime Organization IMO.

Finland must invest strongly in the work of the Arctic Council when preparing for Finland's Chairmanship in 2017–2019. It is in Finland's interests to strengthen the position of the Arctic Council as a forum for cooperation in view of the global significance of the Arctic region. The Arctic Council does not want to be involved in international confrontations.

The EU's observer membership in the Arctic Council would now be possible. The EU has been unanimously accepted as an observer of the Arctic Council, but this decision has not been put into effect due to Canada's reservation related to the use of seal products. This issue has now ceased. The EU should be accepted as an observer of the Arctic Council in the next Council meeting.

In addition to Canada, the United States is becoming active in Arctic policy. It has appointed a special representative of the President to manage Arctic issues and the U.S. Chairmanship of the Arctic Council in 2015–2017. Finland must take initiative and start preparations also from the business sector's point of view. It is possible to include joint issues on the Arctic Council's agenda together with the United States and to promote them during the chairmanship of both countries. A chairmanship troika familiar from the EU could be a suitable model for the Arctic Council, too.

Although efforts are made to keep international political conflicts outside the Arctic Council, they have nevertheless had an impact on Arctic cooperation. This has reflected especially on technology issues concerning the supervision of each country's own areas and the search and rescue (SAR) cooperation in Arctic routes, including training cooperation. From the viewpoint of security and military policy, Russia and the US are strengthening defences in their Arctic regions. Coastal states have a great interest in supervising natural resources and their territorial requirements in the Arctic region. They must continue to show restraint in promoting their own interests while avoiding conflict in the Arctic region.

Arctic Economic Council (AEC)

The Arctic Economic Council was established in September 2014. AEC is an independent organisation acting between the business representatives of eight Arctic countries and six indigenous peoples.

Expansion, e.g. to the observers of the Arctic Council (the Netherlands, United Kingdom, Spain, South Korea, India, Italy, Japan, China, Poland, France, Germany and Singapore) has been discussed in the preparatory meetings.

The task of AEC is to promote sustainable economic growth, tackle trade barriers, foster environmental protection, and to reinforce social sustainability in the Arctic regions. Problem areas have included attitudes towards Russia due to the Ukrainian situation and the lack of strong commitment to the project by the United States.

It is in Finland's interests that the AEC is developed as a bridge between companies operating in the Arctic region, creating a joint set of business rules in the area. The operations of the AEC must be activated and the opportunities offered by it must be utilised for the benefit of Finnish industry.

Finland acts as deputy chairman of the AEC and it has a chance for the next chairmanship after Canada. Representatives from Finland come from Arctia Shipping Oy, the mining industry and the tourism sector.

Nordic Arctic Business Council (NABC)

Established on the initiative of the Confederation of Norwegian Enterprise (NHO) in 2014, the joint venture includes the confederations of industries of Norway, Sweden, Denmark, Iceland and Finland, with corporate directors as members from each of these countries. The Secretariat has a representative of each country's confederation. The agreed duration of the project is two years.

NABC has issued recommendations to improve the operating conditions of companies in the Arctic region and promoted networking of enterprises in Arctic business operations.

The operations, targets and participants of AEC have become largely uniform with NABC in terms of the Nordic countries, due to which the activities of NABC have practically merged with those of AEC. Therefore, Nordic cooperation must be paid particular attention to in AEC.

Team Arctic

Team Arctic gathers together key Finnish companies to develop solutions and joint business concepts for investment in the Arctic region.

The members of Team Arctic are the following companies: Aker Arctic Technology, Arctia Shipping, Boskalis Terramare, ESL Shipping, Finnish Meteorological Institute, Fortum, Konecranes, Lamor, Pemamek, Rolls Royce Finland, Rautaruukki, STX Finland, STX Finland Cabins, and Technip Offshore Finland. The team is coordinated by Gaia Consulting. The operational performance of Team Arctic needs to be assessed.

UN agencies: IMO and ILO

In 2014, the International Maritime Organisation IMO adopted the International Code for Ships Operating in Polar Waters (Polar Code) and related amendments to the International Convention for the Safety of Life at Sea (SOLAS). These aim to protect ships, passengers and seafarers and the sensitive Arctic environment. Although the Polar Code has been approved, its ratification and introduction will probably take years.

The ILO Convention No. 169, which deals with the rights and definition of indigenous peoples, and its processing, as well as the Nordic Sami Convention, must be monitored. EK shall monitor these events in both IMO and ILO and at the national level, taking into account their impact on the policy and investments in the Arctic region.

European Union

President of the European Commission Jean-Claude Juncker has entrusted the European External Action Service (EEAS) with a task of outlining the allocation of responsibilities in Arctic policy. This is a communication, which will clarify the responsibilities and measures of the Arctic policy in the EU. For the time being, the Directorate-General for Maritime Affairs and Fisheries (DG Mare) and EEAS have been the main actors in Arctic policy in the EU.

The communication will be completed by the end of 2015, and consultations will be held in spring and/or autumn 2015. That will be followed by readings by the Council and the European Parliament. The Arctic Communication should include all EU policies. The EU is an Arctic actor, which must specify its contribution to Arctic issues. The consultations also deal with Arctic funding by the EU. The Finnish government, northern regions, organisations and the business sector must give a strong input in the consultations.

In the EU, Arctic issues must be coordinated by one body. Arctic issues must be discussed with one voice in view of third nations. The best coordinator would be the High Representative of the European Union and the European External Action Service (EEAS) under his authority. Substance responsibility would be shared by the appropriate directorate-generals and agencies. In addition to EEAS, key actors include the Directorate-Generals for trade, industry, maritime affairs, energy, environment, transport, and research and development, as well as the Cabinet of the President of the Commission.

European industry must be united and speak with one voice about its projects and needs to the EU administration, also in Arctic issues.

Part of the new investment fund of EUR 300 billion is earmarked for energy and infrastructure projects. The Arctic issues may be included in these projects. Finland must place northern transport connections to the top of the agenda when the investment funds are distributed and in the TEN projects. The Finnish government must take the initiative to prioritise these projects together with the other Nordic countries when decisions on the TEN-T projects and the loans from the investment fund are made. The Nordic countries must propose amendments to the TEN-T network guidelines if they prevent construction of transport networks in the north on the basis of small traffic volumes. The objective must be to build the EU transport and logistics network in the south-north direction all the way through Finland and to the northern seas. The opportunity of the transport and logistics partnership in the Northern Dimension to act as a coordinator must be exploited. Tekes and Finnvera could mediate loans from any investment funds to small and medium-sized companies in Finland.

Finland could provide expert help, advice and messages to different Directorate-Generals. The subject groups and expertise must be agreed on with industry. Meetings between political leaders must deal with Arctic issues. Finland, Sweden and Denmark should carry on joint EU policy by raising issues that are interesting to us in the EU bodies. Norway's involvement and the use of its resources in the management of the Nordic Arctic policy in Brussels must be acknowledged.

Northern Dimension (ND) cooperation plays a prominent role in northern policy, and its partnerships have potential in cooperation with Russia also in the future. ND provides an opportunity for non-political, practical and productive cooperation with Russia. The greatest joint benefits have been achieved and can still be achieved in the ND partnerships on the environment and on transport and logistics. The project potential in environmental partnership rises to billions of euros, and its projects can still offer good prospects to Finnish equipment suppliers and project experts.

Funding of ND projects by the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB) should be safeguarded taking account of the EU's interests, e.g. in the sanctions policy.

The EU Strategy for the Baltic Sea Region has 22 priority areas. The areas that are most clearly connected to northern issues are removing transport bottlenecks, improving competitiveness, and developing innovation, research and technology. Cooperation with the north-west Russian strategy has been discussed as a special measure. Finland has emphasised cooperation with other regional structures, such as the Council of the Baltic Sea States (CBSS), Northern Dimension and the Nordic Council. The strategy will be updated in spring 2015. Finland must actively contribute to its preparation on the basis of clear targeting by the government.

Nordic Council and Nordic Council of Ministers

Arctic activities are high on the agenda of the Nordic Council and the Nordic Council of Ministers. Especially environmental issues and the rights of indigenous peoples, as well as security policy, have contemporary relevance. The Nordic Council considers that Arctic issues can be promoted by seeking cooperation with the European Parliament and by carrying on Nordic cooperation within the EU. The Council should receive information about new border restrictions as a matter of urgency in order to take action. Considerable efforts must be made to the removal of border restrictions.

Nordic competitiveness would be encouraged by the removal of remaining border restrictions, such as harmonisation of professional qualifications between the Nordic countries. Synergic development should also be fostered in border-crossing municipalities, e.g. in administration, services and infrastructure. This would give a boost to logistical solutions and tourism.

If the EU is accepted as an observer of the Arctic Council, it will also improve the cooperation opportunities of the Nordic countries in the EU Arctic policy.

Barents Euro-Arctic Council

The Barents Euro-Arctic Council is an important practical cooperation forum, of which the Joint Barents Transport Plan is a good example. Lately, especially the Nordic countries have worked well together within the Council. The meeting of the foreign ministers of the member countries of the Barents Euro-Arctic Council will be held

in Oulu in October 2015. The business sector must also be given a platform in this meeting.

The Barents region is the most significant area of investment in Europe, and Finland is located in the middle of that region. In addition to oil, gas, minerals and logistics, fishing is becoming a focal point of interest. Tourism is also growing. Due to the increased activities, we must pay attention to the development of search and rescue operations, oil spill prevention and environmental impact assessment. These issues should be agreed on between the states and actors.

Financial matters have played a key role in the Barents Euro-Arctic Council during Finland's chairmanship. A working group has been appointed to examine funding issues in Barents cooperation. The end report of the group will be published after the end of the Finnish chairmanship in autumn 2015.

The Council of the Baltic Sea States (CBSS) together with its secretariat and the Ministry for Foreign Affairs must assess which issues in its rules of procedure are connected to Arctic and northern issues.

Key Arctic institutions

Name	Activity	Members	Other background
Arctic Council (AC)	An intergovernmental forum that produces scientific information and gives recommendations on, e.g. the following themes: the Arctic environment, environmental protection and sustainable development. Implementation of the recommendations is the responsibility of the member states. The main decision-making body is the meeting of the foreign ministers, which is held every other year.	Iceland, Canada, Norway, Sweden, Finland, Denmark (Greenland and Faroe Islands), Russia and the USA. Indigenous peoples are also represented.	Established in 1996. Its predecessor was the Rovaniemi process, which focused on Arctic climate issues. www.arctic-council.org
Arctic Economic Council (AEC)	An economic organisation established in 2014. Promotes business activities and sustainable economic growth in the Arctic region. Shares information about, e.g. best practices, technological solutions and standards.	Its members represent companies from the Arctic Council member states and indigenous peoples.	Closely connected to the Arctic Council.
Nordic Arctic Business Council (NABC)	A project established by the Nordic confederations of industries, launched in 2014. Promotes the business environment and economic climate in the Arctic region.	Its members are 1–5 corporate directors from each Nordic country.	Very close cooperation with AEC.
Barents Euro-Arctic Council (BEAC)	An intergovernmental council that promotes stability and sustainable development in the Barents region.	Actual members are Iceland, Norway, Sweden, Finland, Denmark, Russia and the EU. Observers are the Netherlands, United Kingdom, Italy, Japan, Canada, Poland, France, Germany and the USA.	Finland held chairmanship in 2013–2015. Works in close cooperation with the Barents Regional Council. Established in 1993. www.beac.st
Barents Regional Council	A regional counterpart to the above Barents Euro-Arctic Council. Together they form a cooperation forum for regional administration authorities, non-governmental organisations and northern indigenous peoples.	13 provinces/counties from the northern areas of Finland, Sweden, Norway and Russia.	Key themes include environmental protection, networking of enterprises, and transport connections.
Northern Dimension	A joint policy between governments, also expanded to include universities and research institutes, as well as the business community. Aims at strengthening stability, well-being and sustainable development through practical cooperation.	EU, Russia, Norway and Iceland. Geographically, includes North-West Russia, the Baltic Sea and the Arctic regions of Europe (incl. the Barents region).	Sectorial partnerships deal with the environment, public health and social well-being, transport and logistics, and culture. www.northerndimension.info
Northern Dimension Business Council	Platform for corporate networking and a channel for influencing. Aims at improving the competitiveness of companies in the Northern Dimension region and promoting a dialogue with the administration.	Corporate representatives from the Northern Dimension countries (EU incl. Finland, Russia, Norway, Iceland).	Annual forum in St Petersburg.

Source: EK

Arctic policy in different countries

Norway

Norway has major ongoing projects, and new ones will be taking part in the tender rounds in the near future. Northern Norway is growing, and it is a more risk-free area than northern Russia. Norway's potential for economic cooperation must be observed in Finland's policymaking.

Norway has EUR 612 billion in the so-called oil and gas fund (Government Pension Fund Norway/rest of the world). The Norwegian and Finnish governments should discuss the preconditions on which the fund can distribute financing for joint projects, taking account of overall benefit to society, for example, in the construction of infrastructure.

Finnish expertise is attracting interest in Norway. It is efficient and of high quality, and the working methods are familiar. Statoil has ordered significant subcontracting from Finland for oil and gas drilling rigs due to the high level of expertise and quality.

The Norwegian earth construction and road infrastructure, which needs both basic maintenance and new construction, offers a clear business opportunity. The construction and modernisation of the Norwegian power network is another important area. The Norwegians trust Finnish expertise, and the country has a shortage of workforce and builders who are able to operate in demanding cold conditions. In this matter, we must act in cooperation with the business sector.

In connection with his visit to Norway in autumn 2012, President Sauli Niinistö proposed an Arctic partnership between Finland and Norway, which was agreed on in spring 2014. Bilateral annual consultations were launched on the basis of the initiative in October 2014. The opportunities offered by the consultations must be utilised in future, too, especially from the viewpoint of promotion of exports to the northern regions.

Norway's priorities in northern policy

In Norway, the policy of northern areas (High North) is regarded as a key focus area in foreign policy. The ministry for foreign affairs is responsible for strategic coordination, and the regularly convening state secretary committee, with representatives of several ministries, is responsible for reporting. The Prime Minister's office is responsible for operative coordination and ministerial-level monitoring. The policy for the northern areas strives for

- strengthening the competitiveness of northern Norway
- examination of the tax and payment policy
- investment in research, and
- development of roads and infrastructure.

The Nordkloden report, which was published in December 2014, provides information on Norway's objectives to guarantee stability, predictability and peaceful development of the region, especially in light of the current security policy situation. The Norwegian government emphasises the importance of responsibility in the development of infrastructure, environmental protection, and search and rescue operations.

Its objective is to help the business sector to utilise the potential of the northern areas in a sustainable way. The means for this include expertise and strong education and research centres: the northern areas should be developed into one of the most innovative and most expertise-based growth areas on the global level.

In its industrial policy for the northern areas, the Norwegian government will emphasise (1) international cooperation, (2) the business sector, (3) expertise, (4) infrastructure, and (5) environmental protection, security and preparedness.

An opportunity to tighten bilateral relations

The Norwegian northern areas policy has previously focused on Russia, and it can be deemed to have acted as a tool to develop relations between Norway and Russia. As the emphasis on Russia is withdrawn, Finland will have an opportunity to tighten its cooperation with Norway. Our bilateral Arctic partnership and cooperation in the business sector must be utilised in this to the full.

The Nordkloden report identifies the increasing significance of regional organisations and Nordic cooperation. In order to strengthen Nordic business cooperation, the report refers to the *Growth from the North* report commissioned by the Prime Ministers, concerning the potential offered by economic cooperation in the northern areas. It is important to Norway that the work of the Arctic Council emphasises economic cooperation.

Norway pursues continued cooperation with Russia within reasonable possibilities. Norway is planning to open sectors against the dividing line for exploration operations. Cooperation with Russia is compulsory with respect to cross-border findings according to the dividing line agreement. This may be realised in the near future with respect to new findings.

Finland to get a slice of mega-investments

Winning contracts in the northern areas is not down to political processes: the most important thing is to be present, to take part in the conferences of the field, to network and to carefully prepare for any process, and to actively seek agreements, also taking into consideration the major oil and gas companies located in central and southern Norway.

There are about 200 Finnish companies operating in Norway. Some business sectors have very few Finnish companies.

From the Finnish point of view, Norway is the biggest northern actor, area and partner, especially in terms of allocation of investments and business potential. Norway is investing in sectors that have growth potential. The Norwegian foreign ministry is granting NOK 150 million in the implementation of business projects in northern areas through Innovation Norway in 2014–2019. The objective is to turn the expertise and research results of the northern areas into business operations.

One example of this investment is the 'Ny industri I nord' project by Sintef's Tromsø unit, defining the industrial sectors that should be developed in the north and how to do it. The objective is to turn northern Norway from a raw material store into an area of process industry by combining several industrial value chains. Synergies between different sectors can create a regional competitive edge, promote local production and reduce the export of raw materials. Oil and gas, ore and minerals, as well as fishing and mariculture are seen as growth areas. The Tromsø unit of Sintef, which heads the project, is interested in expanding cooperation with Finland.

Norway is strengthening maritime research and innovation activities in the northern areas in order to prepare northern Norway for the increase in Arctic seafaring and the utilisation of subsequent opportunities. The government is also preparing a comprehensive strategy for the maritime industry, which will be published in 2015.

Soil inventories are carried out in northern Norway in order to develop extractive industries. This will also give an opportunity to permit sea emissions of mines. Productivity of the fish industry is developed, e.g. by investing in research and legislative development. The government is also investing in marketing work to develop tourism.

The long processing and implementation time of major projects is a bottleneck for development of the northern areas. Therefore, the Norwegian government is investing in simplifying permit processes and shortening processing times.

Sweden

Sweden is a natural partner for Finland in all sectors, for example, in the energy sector, environmental issues, sustainable development, research, and in humanitarian activities. Finland has close economic cooperation with Sweden. Both countries have significant expertise in maritime and environmental issues.

The Bothnian Arc could act as a joint business and working area in the same way as the Öresund region in the Malmö-Copenhagen area between Sweden and Denmark. The Öresund model has worked well as an economic area, and mobility has increased among both the workforce and enterprises. The economy and business life of both countries have benefited from the cooperation, and the area forms an entity that can be independently marketed without linking it to either Sweden or Denmark. The Öresund region is governed by an administrative unit of 12 municipalities.

Cooperation related to mining operations with Sweden would be useful in the technological and logistical sense. However, it would require a political initiative from the governments of Sweden and Finland in order to encourage cooperation. There would also be an opportunity for cooperation in the modernisation of the extractive industry in north-west Russia. Sweden does not have close industrial or technical cooperation with Russia, and it has a low trading volume with the country. Pressures from the environmental movement are strong, and the rights of indigenous peoples are highlighted to an increasing extent. The Swedish mining sector is strong, and resources are invested in it by building the infrastructure. The Swedish state mining company LKAB (Luossavaara-Kiirunavaara Aktiebolag) offers subcontracting opportunities to Finnish companies.

Finland, Sweden and Norway must step up their energy cooperation. The creation of an EU energy market and possibly an energy union, and Finland's great dependency on energy imports from Russia are topical reasons to raise Nordic cooperation to a new level.

The smooth cooperation between Sweden and Finland should be continued in the northern areas. There is no separate Arctic partnership between our countries as it has not been deemed necessary due to the already extensive cooperation.

Denmark / Greenland

Denmark has an active Arctic policy, the resources of which are topped up. Denmark is reducing the use of coal and now seeks an alternative to it from northern gas. Denmark's Arctic policy is a long-term process, which is not tied to parliamentary terms.

Greenland's potential as an Arctic target area has grown. There is a great need to invest in the mining industry, but it is hampered by the lack of infrastructure, small population and the low level of education of the people, as well as the falling price of metals. Therefore, the starting points for extensive infrastructure and development are weak. There is a dispute between the Danish and Greenland governments on the mining of uranium.

The energy companies have left Greenland for the time being after the raw material prices have fallen. The natural resources are known, but the timetables for their exploitation have been extended. Another problem in oil and gas drilling is the difficult ice conditions. The Finnish maritime industry has a solution for this for when exploration operations are continued in due time. In Greenland, mining operations and oil and gas exploration will require infrastructure solutions and expertise in the next few decades.

Denmark is paying an increasing amount of attention to the rights of the indigenous peoples, and not only in terms of Greenland.

The Finnish embassy in Denmark has organised Green Shipping events together with Finpro, inviting Finnish and Danish companies operating in the northern areas. These companies are SMEs focusing on the technical capacity. Joint projects between the companies have already been created.

Denmark has a lot of potential and it must be embraced as a partner in several different sectors. One example is the export of technologies and applications in the extractive industries to Greenland and the shipping and haulage operations of Maersk, which is the main haulage company in the Northeast Passage in Asia.

The opportunity of business operations outside Scandinavia, such as in Greenland and North America, must be investigated.

Russia

The Arctic is an increasingly important area for Russia in the strategic sense. The country develops its northern areas, e.g. by creating a new Arctic administration. For that purpose, it will probably establish a ministry-level administration unit. Russia's northern administration also includes the Northeast Passage office. The president has a special representative and advisor for the Arctic, and the ministry of foreign affairs has an Arctic ambassador.

The Arctic area's significance to Russia in terms of security policy has grown. It is making provisions and developing its bases in the region. Russia is planning to have 14 maintenance stations along the Northeast Passage, and these would also have a military policy significance. An Arctic command centre has been established in the Arctic region. The position of Murmansk and Archangel as regional centres is strengthened. Russia wants to expand its Arctic continental shelf and to be an active member of the Arctic Council.

Russia still regards cooperation in the Nordic Dimension as important.

Exploitation of oil and gas reserves

The significance of northern natural resources, such as minerals, oil and gas reserves, to the Russian economy is growing. Investment planning in north-west Russia is active especially in transport and logistics. This offers good opportunities for Finnish companies.

Due to the oil and gas price trend, Russia is focusing on onshore sources and especially on the exploitation of the Yamal gas reserves. Due to the current low market price of oil and gas, the exploitation of Arctic offshore reserves is not profitable for the time being. The two gas pipes of Nord Stream in the Baltic Sea operate naturally, and the possibility of a third pipe is still being mentioned, e.g. in BP's statements.

In offshore operations, Russia has been dependent on international collaboration, especially in the exploitation of oil resources. Statoil has a substantial licence agreement with Rosneft. However, this joint venture has been suspended due to the sanctions, as has happened with all other collaboration with major western companies. Russia needs international cooperation with onshore projects, too.

Demand for energy and cleantech expertise

Low energy efficiency and the resulting significant environmental problems are among the greatest problems in Russian economy. The most serious of these are the particulate emissions, so-called black rain, produced by the northern energy plants. It falls on Arctic glaciers and therefore poses a serious global environmental threat. Improvement of energy efficiency is the next focus area in environmental partnership within the Northern Dimension after the water treatment plant projects have mainly been completed with the EUR 1.5 billion investments.

The Finnish energy and technology industry would have many projects to offer to the northern and Arctic areas of Russia. These have partly been under preparation and implementation, such as the energy efficiency and district heating projects. These projects are worth several billions of euros.

Other potential projects include cleantech projects and cooperation in the modernisation of social structures and services in relation to, e.g. the electricity network, district heating, energy efficiency and cold construction. The Finnish mining technology would be of use in the development and expansion projects of the Murmansk mining industry, as would Finnish environmental expertise in the soil clean-up in old mining and industrial areas. Another potential area is the organisation of waste management in north-east Russia.

Russia is actively developing the utilisation of the Northeast Passage. This may be of great significance for Finland's future logistical position. The expertise of Finnish companies and research institutions must be utilised in the development of the Northeast Passage and organisation of its coastal support services. These include training seafarers in moving and navigating in icy conditions, development of weather and ice information services, development of satellite navigation and location systems, and cooperation in search and rescue (SAR) operations. Finnish Arctic expertise in the building of ships and icebreakers is also an excellent export product for the needs of the Northeast Passage.

Normalisation of trade relations is a future challenge

From the Finnish point of view, Russia is now playing a waiting game. Even if the sanctions are dismantled, restoring the market position may prove to be a difficult task. The next government needs to draw up industrial policy guidelines related to Russia.

Increased tensions between superpowers and in the relationship between the EU and Russia have a direct impact on the opportunities and willingness to invest in Russia. Investment volumes and economic cooperation with Russia have diminished due to the collapse in Russian oil income, high price of financing and sanctions. This has also been affected by the increasing economic uncertainty, the unclarity about the accuracy of regulations, and the decreasing cash flows. This can be seen directly in the falling number of orders.

Russia is still a potential market for Finnish business operations. The Russians still wish to carry on with Arctic projects despite the sanctions, but the deteriorating relations with the EU and the USA have provided especially China, India and South Korea with an opportunity to take over the markets.

The Ukrainian crisis has had a profound impact on relations between Russia and the West. Even if the sanctions were lifted, it would be difficult to restore trust and cooperation and regain the markets.

Restoration or improvement of relations requires diplomacy and a pragmatic approach. Cooperation and trust can be created through practical projects. Finland and Norway have longstanding experience in this, and they could act together towards Russia in order to promote practical cooperation projects.

East Office, which is administered by Finnish industries, has direct connections to Russia through its member companies. These are

major Finnish industrial companies with longstanding trade relations with the east. East Office can provide information and experience about Russian business operations.

A bilateral Arctic partnership between Finland and Russia was launched in February 2011. It consists of a political dialogue and cooperation between enterprises, researchers and regions.


USA and Canada

For the time being, there has not been any large-scale practical project planning in the Arctic regions of the United States and Canada. Trade relations have been hampered, for example, by the approval and administrative regulations required for icebreakers, which is related to the protection of national industry and to security policy.

Canada has traditionally had a strong northern policy with its own budget. The country has become active in Arctic policy along with its chairmanship in the Arctic Council. Its priorities include shipping, exploitation of natural resources, and improvement of the conditions of indigenous peoples.

Canada's significance as a northern partner has grown due to the EU-Canada free trade agreement, which is under preparation. If the protection mechanism of the free trade agreement remains in force in the shipping sector, it will not promote the export of Finnish shipbuilding technology to Canada.

Cooperation between Finland and Canada has been reinforced with visits by economic delegations. Research cooperation and 'business to business' activities between the two countries have a good chance of success.

Finland and Canada act in cooperation through the Arctic Economic Council (AEC). The business sector must take active part in AEC's operations.

The USA is raising its profile along with its chairmanship of the Arctic Council starting in 2015. The president has appointed a special representative for the Arctic region, who has paid a visit to Finland. Relations with Alaska especially in the business sector can be promoted during Finland's chairmanship of the Arctic Council.

The three main themes of the US chairmanship programme in the Arctic Council will be

- development of search and rescue cooperation (SAR)
- development of an economic system in the Arctic region, also taking into consideration the business opportunities and living conditions of indigenous peoples
- environmental issues, building of infrastructure, energy supply, and climate change mitigation (including Black Carbon and methane emissions).

The United States also hopes that its themes will be carried on into the next chairmanship.

From Finland's viewpoint, it would be important to improve the preconditions of economic cooperation with the United States. Finland must be active when the USA boosts Arctic research cooperation. If realised, the TTIP free trade agreement should safeguard access by Finnish technology companies to the US market also in terms of their Arctic expertise.

Other countries

The Asian observers of the Arctic Council, China, Japan, India, South Korea and Singapore, are increasing their engagement in Arctic policy. They all are willing to invest in the region and are interested the development of the Northeast Passage.

South Korean shipyards have commissioned components from Finnish suppliers (Wärtsilä, ABB) for Arctic LNG tankers manufactured in South Korea. These have been significant orders for the Finnish subcontracting industry.

China, India and Singapore are interested in research, transport routes and energy supply (LNG deliveries) in the Arctic region. They are also prepared to deliver energy technology to Russia. China's interest has clearly increased due to sanctions against Russia. China is interested in the natural resources of the Arctic. Therefore, it is offering technical expertise and cooperation to Russia, to be realised, e.g. in the LNG plants to be built in the Yamal Peninsula.

Japan offers new business opportunities. It has shown interest towards Arctic operations and is prepared to take part in Arctic railway projects in Finland. Japan is also interested in cooperation in

maritime transport and LNG deliveries. Japan offers new business opportunities. On the other hand, cooperation at the corporate level has been limited so far.

China, India and South Korea are seeking new markets and Arctic co-operation with Russia. Finland can provide expertise and experience also for these countries in the management of joint Arctic projects.

RECOMMENDATIONS

- When the situation allows, it would be important to address the EU-Russia sanctions that hamper global environmental cooperation and have a negative impact on the protection of the Arctic environment and climate change mitigation. These must be discussed, however, taking into consideration that Finland complies with the decisions on EU sanctions in view of Russia.
- Developing cooperation in the Bothnian Arc with an objective of a common business and employment area as in the Öresund model in the Malmö–Copenhagen region between Sweden and Denmark. A common economic area would increase mobility among the workforce and businesses and strengthen competitiveness in the region. The development of a common Bothnian Arc economic area and the new administrative model must be examined between Finland and Sweden and the actors in the region.
- The Nordic countries are a key reference group in Arctic and international organisations with respect to know-how, expertise, social policy and the social structure. Cooperation is also carried on elsewhere than in sectors related to the regulation of the Arctic region. The Nordic countries must drive these issues forward in the EU on Finland's initiative. Building of an Arctic transport infrastructure requires both Nordic and EU-level cooperation. Finland, Sweden and Norway can jointly seek funding from financial institutions and EU funds. To carry out the projects, it is necessary to analyse and update the existing Barents transport plan.
- Significant investments in the Norwegian oil and gas sector, electricity and heat generation and maritime industry, transport and construction industry offer Finnish companies opportunities in the field of Arctic technology, energy grids, geology and environmental expertise, including oil spill prevention and wastewater treatment. Statoil plays a key role in energy projects, and it can order subcontracting from Finland for its vessels and oil rigs (SteelDone, Tschudi Group, Statoil, Storvik&Co, LKAB). We must create an extensive information and cooperation network together with the authorities and the business sector in order to be included in these projects, also taking into consideration the cooperation possibilities of the Nordic business sector to participate in the projects.
- The Finnish and Norwegian governments must examine how the oil and gas fund of the Norwegian state could be used for building a common infrastructure.
- Cooperation would be facilitated if Norwegian companies invested in Finland and established subsidiaries in the country. There is already extensive technical expertise available in the Oulu region. The Finland House in Tromsø should be made available for enterprises and regional actors as well as for state actors (Finpro) in communications, networking and gathering information from the Arctic region.
- Border restrictions must be monitored and their removal must be promoted in relation to the mobility of workforce and businesses and to business operations. Border restrictions must not be extended as a result of EU legislation. Cooperation across municipal borders provides opportunities to all Nordic countries, e.g. in fire and rescue operations, environmental protection and the building of infrastructure and business operations.
- Harmonisation of professional qualifications between the Nordic countries would promote labour mobility. Synergy must also be fostered in border-crossing municipalities, e.g. in administration, services and infrastructure.

4 Business opportunities in different sectors

Finland has Arctic expertise especially in the building of infrastructure, environmental issues, oil spill prevention and response, shipping, research and in ice and weather services. In addition to high technology, we have world-class tourism services in the north.

Border obstacles to business operations

The Arctic and northern regions have great potential, and several reviews have been carried out. Even if there is demand, there are many obstacles to the operation of Finnish companies in other Nordic countries. Demand for Finnish expertise could be encouraged by creating consortiums and cooperation and by providing opportunities through larger entities and clusters. These could motivate companies to take part in northern projects. Demand is not created with institutional models, an individual search for projects or by seeking funding channels.

The use of national services and actors has been a priority. It is not easy to enter the market of another Nordic country when the regulations and recommendations usually support the use of domestic expertise. Therefore, large companies should have units or subsidiaries in different countries.

Border obstacles are also still commonplace in day-to-day business operations. Various regulations in Norway, for example, in value added taxation have resulted in a lot of border bureaucracy and need for preparations when exporting Finnish machinery and equipment to work sites in Norway.

Barents region needs EUR 140 billion in investment

The Barents Region needs an estimated EUR 140 billion in investment. Key sectors are oil, gas/LNG, mining industry, wind power, logistics investments, and the development of the power grid. Improvement of the energy network in northern Norway provides significant opportunities for Finnish energy industry (e.g. transformer deliveries to Norway by the Vaasa energy cluster). Fish stocks and the so-called mariculture industry (including exploitation of algae) are growing substantially. Tourism is also increasing.

The Swedish and Finnish construction industry is partly integrated, which has been essential in succeeding in competition. On the other hand, the energy sector is least integrated although we have a common market. This offers a significant development potential.

The strong growth of northern Norway can be seen in public investments, such as the building of hospitals, schools and transport infrastructure. This gives Finnish companies a good chance to take part in the planning and construction of these projects. The great demand in the Norwegian construction sector has created a shortage of labour and enterprises. There would be work for Finnish companies, but it is difficult to get the staff. Norway could take advantage of Finnish engineering and other professional workforce.

Public/private cooperation is natural in the Nordic countries and it should be utilised. Companies must also assume responsibility and raise the level of standards in projects. In such a case, companies must have a vision that is in line with Nordic cooperation.

The development of an information and communication system and the harmonisation of existing channels are essential for winning projects and building offers.

At the beginning of investment planning and building, it is necessary to receive guarantees from society that the projects do not fail due to prolonged permit procedures and appeals. Otherwise, the so-called political risk may turn out to be higher than the financial risk when assessing the feasibility of the project. The permit procedure must involve certainty about flexible processing of matters, with a common policy prepared between the state, industry and stakeholders. The study must be carried out without delay.

Indigenous peoples must be included in the development of areas, services and natural resources. It is necessary to take into consideration that these peoples must also enjoy the benefits. The issue of indigenous peoples covers different nations, land use questions and residents' rights.

Finland to become a hub of logistics and data flows

Finland has been regarded as an island, but if the Northeast Passage opens to wider traffic and if a good connection is built from Finland to the Arctic Ocean, Finland can become a transit route. This will open new markets. That is when northern railway projects are important in terms of Finland's exports and imports. Finland's position as a logistical hub is globally significant when considering the Northeast Passage, the Atlantic connection, the Arctic Ocean railway and the railway connection through Siberia, as well as the shortest flight route to the economic centres of Asia via the Helsinki-Vantaa Airport.

The logistical hub is also linked to the creation of a data hub in Finland. This would utilise the above-mentioned transport connections when a cable link would be designed from Asia to Europe via the Northeast Passage. After that, data communications between Asia and Europe would travel along the Northeast Passage cable via Finland and further to Central Europe along the sea cable in the Baltic Sea. The Northeast Passage cable would make Finland an extremely attractive location for cloud service business and data centres. The connection between Europe and Asia would be shortened by thousands of kilometres and data transmission would become faster.

The Arctic Ocean route has three alternatives, taking railway and road links into consideration. Investment in the building of infrastructure and in the procurement of equipment is needed for these projects.

Lack of language skills is a barrier

The lack of language skills is the biggest individual barrier for the operation of Finnish companies in Norway and Sweden. Swedish language skills open significant work and marketing opportunities to other Nordic countries, providing a competitive edge over other European countries. Finnish companies should invest in language training for their employees, also in English in addition to Swedish. Some international contracts have strict regulations regarding the language skills of their employees for safety reasons. This applies to all companies, regardless of their size and line of business. Russian language skills are needed especially in the tourism industry.

The passiveness and prejudiced attitude of Finnish companies towards, e.g. language skills also play a part. The state should also pay particular attention to language teaching at school. The language skills of pupils have significantly deteriorated. This does not encourage cross-border mobility of Finnish workforce and capital. Cross-border training programmes (vocational training and university-level education) would also improve language skills and harmonise vocational qualification requirements. Moreover, contacts made at an early age would also be of advantage when entering the working life.

Networks are needed

Stronger mutual cooperation between companies supports market entry. The enterprise-driven Kasvuryhmä (Growth Group) initiative is an excellent example of networking and mutual mentoring of entrepreneurs and the top management of SMEs in order to create growth and new business opportunities. Investment in the research of expertise and in the strengthening of a culture that supports growth entrepreneurship is also needed.

Northern projects can be carried out sustainably and managed so that all sectors have room for manoeuvre. It is in the Finnish interest that we can deliver different technologies for demanding projects also in the northern regions. To succeed in the Arctic and northern areas, we require the best expertise and a functioning overseas network – i.e. an international network including the foreign affairs administration.

Construction industry

A functioning social infrastructure and services are the basis of the construction industry. In this, the state plays a key role when preparing for and raising the level of preparedness for winning and implementing public/private investments. Raising the level of preparedness is needed in case growth and projects take off. This also means preparing for the planning of infrastructure and projects. Preparedness must be built together with the Nordic countries and northern organisations and actors, starting from the local government and regional levels all the way to the level between different countries.

In this area, the weakness of the basic channel network is a key problem. This must be given serious consideration as it is a question of preparedness and building a platform for future projects. Finland must invest in the EU's next financial frameworks in order to gain transport and channel projects taking place in the north.

Business planning must also include social infrastructure, such as kinderkartens, schools, and healthcare and welfare services.

In some projects, nature conservation objectives are in conflict with the efforts of the extractive industry. Building of an industrial infrastructure also creates opportunities for tourism. This requires cooperation in project planning. The projects of all business sectors create work for the construction sector whether it is a question of tourism, mining operations, transport or the building of energy connections.

Russia must prepare for long-term projects of up to 10–12 years. This will not be successful without establishing consortiums to manage the projects. When the projects are long, the state's participation is important in order to know what happens in the political sector. The construction industry has not discussed cooperation with respect to Russia, but this should be investigated and viewed beyond the period of crisis, with a perspective of 10 to 20 years.

Mining industry

Mining projects need road and railway links, zoning, and spatial planning. These are logistically challenging projects. The government has taken a decision-in-principle on participation in the Sokli-Kellokoski road. According to the operator (YARA), the authorities must be included in the projects so that they can be implemented. The infrastructure of neighbouring countries, especially that of Norway and Sweden, must be taken into account in major infrastructure projects.

In mining operations, the cost benefit of transport must be calculated so that mobile volumes are also included. Current projects include Sakatti, Kevitsa (only one user), Sokli (several users), Pampalo and Pyhäsalmi. There are a total of 50 mines in operation in Finland. The transported volume of materials is relatively small, about 2 million tonnes. The target could be 7 million tonnes, but a maximum of 10 million tonnes. The companies' share of the costs is considered case by case, but the default value is about 50–70 per cent. Taking account of the above-mentioned volumes, the Bothnian Sea is optimal for transportation. Efforts should be made to process the products of the mining industry in Finland.

Case: Sakatti

Sakatti is Europe's largest and richest mining deposit, and its permit process is underway. With the current procedure, this could last 12–17 years. The planned mine is located between two Natura 2000 areas. With respect to Natura 2000, the objective is 'no net loss', according to which compensatory, similar areas are sought nearby. That way, there will be no negative impact on biodiversity.

Road improvements are required in terms of Sakatti. The products are concentrated and transported to the Tornio port and delivered further for use by the Finnish metal industry. Ore is not exported from Finland, which reduces the need for its imports.

Russia has introduced the modernisation and expansion of its existing mining industry as a new focus area as the oil and gas projects are postponed. These projects include a transport centre for the Port of Murmansk and building of a railway line. In addition to technology for mines that are modernised, environmental aspects have also been raised. The Finnish mining and environmental technology could offer solutions for this. Taking part in the projects requires associations of undertakings.

In Greenland, there is a great need to invest in mining operations. The most pressing problem is the lack of infrastructure. Oil and gas exploration has also been active, but it has now been put on hold to wait for a rise in the global market price of energy. Finnish multipurpose vessels have carried out icebreaking tasks in Greenland

in relation to the above-mentioned activities. The ice conditions in Greenland are very difficult.

Energy industry

The Nordic feature is the big role of the state in the national energy sector. Finland, Sweden and Norway must step up their energy cooperation. This would provide greater opportunities to remove bottlenecks between our countries and also for project implementation. Coordinated operations would strengthen competitiveness and cooperation opportunities.

The energy industry is well prepared for joining northern projects. The sector is considering business opportunities and infrastructure needs. The crisis in Ukraine is having more of an impact on the energy sector than on other sectors. Norway has good chances of subcontracting when the next projects in the Barents Sea take off. Technology and component companies based on the energy industry are in demand as subcontractors for the Norwegian drilling and processing plants (incl. Metso, Steel Done) and also in the dismantling of drilling rigs and vessels in the Arctic region. That is when the need for environmental technology is also discussed.

Case: LNG gas

The energy supply from northern Norway to northern Finland and Sweden must be safeguarded. Economic activities in northern Finland could be based on expanding use of gas especially in industry and transport. Gas is the most eco-friendly and rapidly growing fossil fuel. Norwegian gas / LNG would open new opportunities for Finnish actors to promote the use of gas in the region. There is growth potential of gas along the coast of the Gulf of Bothnia and in northern Finland.

The gas market will grow within industry (incl. Outokumpu), transport and the extractive industry (incl. LKAB) when LNG terminals are completed in Pori, Tornio and Gävle and when shipping from Norway starts (incl. Statoil). LNG can be transported by road from the terminals in the Gulf of Bothnia and northern Norway. This requires improved road connections. That will open up an opportunity to cooperation especially between the mining industry of Sweden and Finland and to carry out measures to improve the route projects that are essential in terms of the transport planning of the entire region.

The development of the LNG network must be invested in throughout the Baltic Sea and northern Scandinavian regions through transport by ship and road.

Increased use of LNG in industry and transport would also open new cooperation opportunities in the mining industry for Finland together with Sweden. LNG gas could also support and promote the use of biogas outside the gas pipeline area.

In terms of Russia, the most significant projects are energy efficiency and district heat projects, reduction of particulate emissions, heat production, cleantech projects, and modernisation cooperation. The example of environmental partnership in the Northern Dimension acts as a model for the above.

It is essential to consider the contents of the projects especially with respect to the technology industry. The projects are related to the electricity network, district heat, energy efficiency and cold construction. For example, Fortum, Neste and Gasum have an inherent interest towards operations in this sector.

In order to improve Finland's energy security, the coordination of energy policy between the Nordic countries must be developed. The most urgent areas are the development of transmission networks within the Nordic countries and between the Nordic countries and Central Europe, safeguarding sufficient security of supply and the creation of common rules, e.g. to develop renewable energy and the retail market.

An increasingly integrated market and coordination of energy policy would also promote structural arrangements. There are over 350 power production companies in the Nordic countries, and this can be regarded as a fairly high number in a capital-intensive sector, as well as an indication of a low level of integration. Even major Finnish and Swedish energy companies are small in comparison with their European competitors. If necessary, governments must reorganise ownership arrangements in order to strengthen the corporate structure.

Nuclear safety cooperation with Russia in regions bordering Finland is important at the Kola and Sosnovyi Bor nuclear power plants. There is also a lot of nuclear waste in the Arctic regions. Finland has a high level of skills in their safe handling and disposal.

Finnish planning in the energy industry and the related technology is highly advanced. For example, Neste Jacobs Oy has advanced world-class expertise in the planning of process technology, as well as demonstrations, e.g. of LNG projects and energy projects carried out in the cold conditions of the north. This kind of expertise is in demand, and it has great business opportunities in the Arctic and northern regions. Other Finnish industrial sectors, such as the construction industry, may also benefit from the project implementation.

Neste Jacobs Oy is one of the largest engineering companies in the EU region: 45 per cent of the company is in American ownership. This could be relevant in accessing the US market.

Technology industry

Arctic and northern projects are important for the technology industry. Mining operations and railway projects are significant for business because they create new demand. Data storage centres, a cable project from Finland to Germany and its possible extension to the north are key questions.

The purpose of the Finnish Information Security Cluster (FISC) is to open business opportunities to its member companies. These include Russia's possibilities of using Finnish technology in district heating projects, in environmental issues and in the transport and logistics sector.

The current digitalisation process in the area of health and medical care and the healthcare technology developed in Finland may provide services in the Arctic and northern regions with long distances.

Finland would like to become a hub of data communications and big data business. This must be raised as a national strategy that also combines different administrative sectors. We need 'farms' for data storage as the volumes have grown and the need for storing digital material has been identified. Finland is a safe storage location. We have a cool climate, stable and constant electricity supply, a solid ground and political climate and a good geopolitical location, and the cooling water is naturally cold. For example, Microsoft will probably increase its investments in Finland. Intel is also interested. Finland has plenty of capacity to expand more widely, too.

A particularly important project for Finland is the data communications cable from Asia to Europe along the Northeast Passage and through Finland. The sea cable between Finland and Germany (Corenet, Cinia) is also related to this.

The Arctic Ocean railway is connected to the above-mentioned goals. If it is built, it will create infrastructure to support economic activities and provide new opportunities for it. Infrastructure projects provide work and support other industry, such as cable, railway and road construction.

The cleantech industry cuts through all traditional technology sectors. The sector has seen growth of over 10 per cent per year. According to the Ministry of Employment and the Economy, the total net sales of Finland's cleantech companies is EUR 25 billion, including almost all of our major industrial companies listed on the stock exchange. We need more leading companies in the field to act as a catalyst for innovations and have a pioneering spirit.

Finland has great expertise in energy efficiency (ABB, Vacon, Kemira, etc.). In the environment technology, e.g. the technology and equipment of Kemira and the Econet Group in the St Petersburg water treatment plants are excellent references. We must also consider the machine and metal industry, as well as the maritime industry. Every level of infrastructure needs technical services and solutions.

The technology industry has solid competence in weather, data and metering services and systems, sensor technology and electronics (Vaisala, Murata Electronics, Okmetic, etc.).

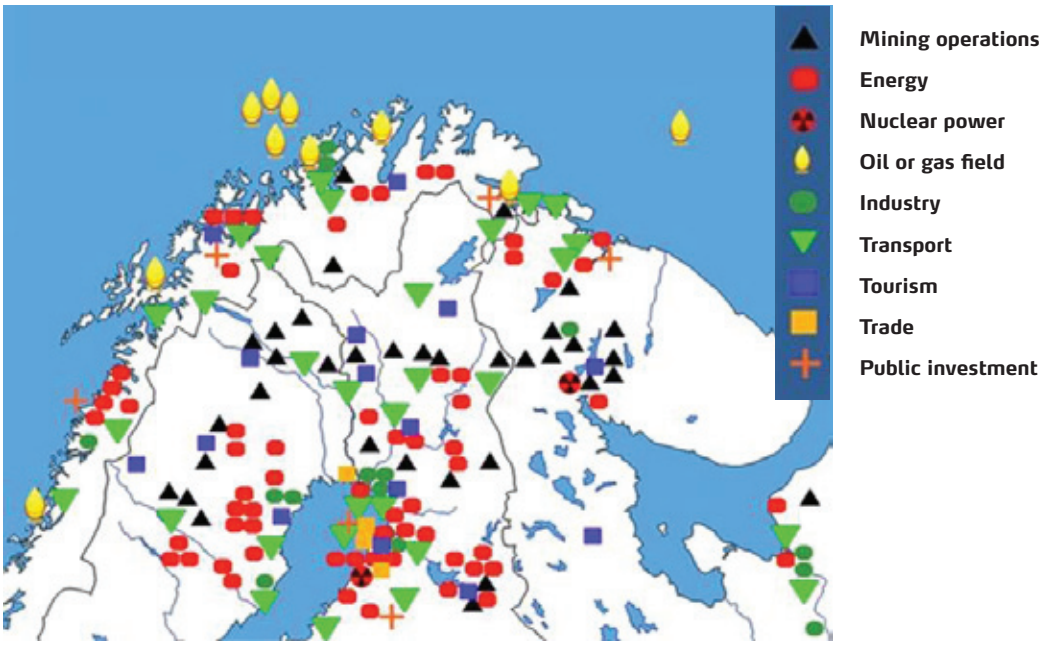
There are many Finnish technology companies that supply parts and equipment to different lines of industry as subcontractors, for example, in solutions for the built environment or in satellite systems, e.g. in polar and northern regions (ESA). Finnish expertise also includes technology related to land signal equipment, radars and telecommunications. Help in accessing the projects is provided by Tekes, which acts as the responsible body for Finland in the EU Horizon 2020 programme.

Chemical industry

In broad terms, the chemical industry covers industrial chemicals, consumer products, goods needed by society and the related services. Chemical products and preparations are used practically in all industrial sectors. The chemical industry is one of Finland's largest industrial sectors as the value of its annual net sales is about EUR 25 billion. This corresponds to about 25 per cent of Finland's industrial production.

Two-thirds of the production of the chemical industry is exported. The chemical industry is Finland's largest exporting sector: it accounts for about a quarter of all exports. The chemical industry employs directly about 35,000 people. It is the only Finnish industrial sector

Examples of investment areas



Source: Lapland Chamber of Commerce

that has made a good recovery from the financial crisis of 2009 by rising well above the level of turnover prior to the crisis.

The interest of the chemical industry lies in logistics. Both imports and exports are essential for it. Most of the trade is carried on with the EU countries and the rest of Europe. The logistical dimension is also significant in terms of oil imports and products processed from oil. Oil accounts for 65–70 per cent of chemical imports.

The Arctic dimension is important for the chemical industry. The opening of a Northeast Passage and an Atlantic connection can make Finland a global transit route. This would open new markets to the chemical industry through both exports and imports. The route serves logistics and that way the chemical and mining industries.

The mining industry and also other industrial sectors, such as the paper, electronics and food industry, benefit from transport infrastructure projects from Tornio to the north. Northern Finland and north-west Russia could offer a new business area for the chemical industry.

The mining sector is important for the chemical industry as the acids, solvents, processing substances, water treatment and water recirculation in mines rely on chemical products.

The share of imports in the chemical industry is substantial, especially oil imports. This also applies to exports. Oil and the products processed from oil account for half of the exports of the chemical industry. Logistical solutions are significant also with respect to import dependency, and Finland's security of supply is also related to them.

Key ports for the chemical industry are Kokkola, Sköldvik and Kotka-Hamina. Uusikaupunki, Vaasa and Pori are also essential for it. Key ports and routes should be focused on in the development of infrastructure. The Sköldvik industrial park is an important place of business for the petrochemical industry.

Innovations have provided good results and success for, e.g. Neste Oil (renewable diesel), Kemira (water chemistry), Yara (fertilisers), Orion and Bayer (medicines), Tikkurila and Teknos (paints) and Nokian Tyres (innovative products). These companies have ample scope for development in future, too, when moving from a fossil economy to a circular and bioeconomy. All this requires excellence in the chemical industry. It provides an opportunity to do things in a new way in relation to transport, fossil fuels and food.

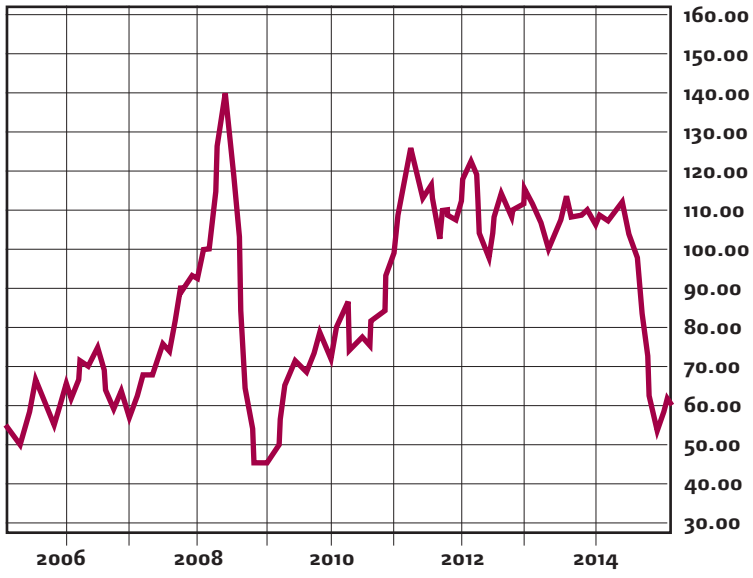
Case: Kemira

Kemira is involved in the drilling of shale gas and oil. Oil and water must be blended at the start of the process and separated on the surface. This requires chemicals.

The process involves a risk and a possible threat to the environment. The United States decided to take a risk with a political decision based on economic policy as the availability of energy and self-sufficiency are extremely important for the US economy.

Europeans, on the other hand, want to avoid risk and environmental hazards. In Europe, shale gas reserves can also be located in densely built areas, unlike in the United States. It is a challenge for industry and technology to develop methods, applications and materials for conserving the environment and reducing the risk aimed at the environment.

Crude oil price trend (Brent), USD/barrel



Source: Nasdaq

Tourism and catering industry

International tourism has grown strongly in the past few years despite the global economic crisis. The Arctic areas of Finland have an excellent opportunity to claim their share of the growth in the international travel industry.

Currently, Finland's revenues from overseas tourism is over EUR 4 billion, and the travel industry employs 140,000 people. Tourism generates profits for several other sectors, such as the construction industry, trade, transport and healthcare services. Tourism also enables better services for residents of the Arctic region.

In relative terms, the role of tourism is the biggest in northern Finland where it is the largest sector. It is based on cleanliness and a wild nature, supported by high-quality accommodation, restaurant and experiental travel services. The Finnish Lapland as a product is the last wilderness of Europe.

Tourism is a significant sector and it takes advantage of the northern region. A good example of this is the extensive winter testing of large international car makes. It needs several support services that contribute to business operations in the north of Finland.

The tourism industry has a potential for growth, which will come from abroad. The number of visitors to Finland has almost doubled in the 2000s. The growth potential of the future lies with Russian and Asian tourists. The Russians have been the largest customer group, and they are still a significant future target market, although the number of visitors from Russia has fallen considerably due to the current political situation.

The rising numbers of Asian tourists have been the result of Finnair's Asian strategy. It has brought and can bring more tourists to Lapland due to successful marketing. Interest towards Finnish Lapland is also growing in the United Kingdom and especially in Norway. Lapland is attractive to Norwegians particularly due to the favourable price level and good services.

Finland's weaknesses include poor accessibility, its lack of wider recognition as a holiday destination, the high price level, and the strong seasonal nature. Mining operations are also sometimes incompatible with the interests of tourism, e.g. in Kuusamo and Kolari. In these conflicts of interest, the various business actors and the authorities must work together to reach a solution that is acceptable to all parties. The business sectors can support each other in the projects, creating business conditions to several sectors.

Accessibility is a key factor now and in the future. Convenient flight connections from Helsinki to the Arctic airports are important, not least due to the Asian travellers so that they can be directed to the tourist centres in the north of the country. A great number of tourists arrive in Lapland by plane with the exception of Russians. Customers from Russia and within Finland arrive mainly by car.

Air traffic is a key bottleneck in terms of accessibility. Increase in tourism requires good flight and transit connections to north Finland and a functioning network of airports where Helsinki-Vantaa has a key role. Many holiday destinations in northern Finland have the advantage of being close to the airport. The airports operate according to Finavia's profitability criteria and tourism alone will not keep them open.

Travel chains are a good solution for areas with no airport nearby. A travel chain guarantees that a coach service between the airport and the resort is linked to the flight schedules.

Case: Flight connections

Finnair has a significant opportunity to bring tourists to northern Finland. It plays a huge part in scheduled air traffic especially when there are hardly any alternative operators outside the high season. The greatest hindrance to the marketing and promotion of summer tourism is the lack of available flights. This issue is a complex one: when there is no demand, there are no flights, and when there are no flights, you cannot create demand. In order to create demand, you need information about possible flight capacity at a sufficiently early stage.

The recently opened flight connection between Oulu, Luulaja and Tromsø is important in order to improve mobility in the northern areas. There is a direct flight connection between Helsinki and Tromsø only during the winter months. Tromsø is becoming the business hub of northern Norway, and the improved connections between Helsinki and Tromsø serve especially business people. Taking tourism into account, this connection could be a so-called circular route via one of the airports in Lapland. This would also serve the benefit of tourism, e.g. in view of Asian feeder traffic. The route would also open an opportunity for east-west operations.

The Barents region needs a permanent east-west connection to serve both industry and tourism.

Organisation of a regular flight connection from northern Finland to Russia would serve, e.g. industry, tourism and cooperation with the universities of Archangel and Moscow.

The key road connections are VT4, VT5 and E8. It is important to look after their maintenance, and industry and tourism share the same needs in this respect.

The significance of the railway is already considerable for some resorts, such as Ylläs and Levi. If new railway lines are planned for the Arctic region, they should also serve tourism. The needs of tourism should be addressed already in the planning stage together with other business sectors. For example, in the area of eastern Lapland with poor flight connections, there are holiday destinations such as Pyhä, Luosto, Salla, Suomu and Ruka, which can be reached by taking a connecting service. The cluster that they form could very well play a part together with other business sectors when planning new railway routes.

The mining industry and tourism share a lot of interests in northern Finland. These sectors support one another, for example, in Levi. On the other hand, the contradiction of these operations is problematic, e.g. in Ruka. Forest felling can also hinder the tourism industry. In northern Finland, tranquillity, nature and cleanliness are the preconditions for tourism. Therefore, protective zones should be established around valuable nature and tourism areas.

Funding for northern projects

The key questions for a business analysis are: is there demand, what is the preparedness for starting the operations, and what are the obstacles. The Arctic and northern regions have potential, albeit demand has fallen due to the global economy, oil prices and international political tensions in relation to the Russian projects.

One of the greatest obstacles is the lack of extensive, intensified cooperation between the Nordic countries. Secondly, readiness for risk-taking and investment is low although there would be money available in the market.

In Finland, we have to take care of the economy, energy and the environment of the northern regions by ourselves. Public-private cooperation is natural in the Nordic countries, and it should be utilised. Companies must also assume responsibility and raise the level of standards in projects. Companies must have a vision that is in line with Nordic cooperation.

Demand for Finnish expertise could be encouraged by creating consortiums and cooperation and by providing opportunities through larger entities and clusters. Demand is not created with institutional models, an individual search for projects or by seeking funding channels.

The Nordic countries could carry out joint marketing towards the EU. In such a case, the bar must be set high, offering Nordic countries an opportunity to seek funding to build infrastructure. This could be used for marketing Arctic projects and receiving more funding for building from the EU investment fund.

The Arctic growth potential must also be taken into consideration in the European Commission's investment package of EUR 300 billion. The role of the EU as a contributor to research is significant. The major part of the fund is allocated to the development of infrastructure. The second part is the support package for SMEs. In Finland, the subsidies could be mediated by Tekes and Finnvera.

SMEs could be granted funds for marketing new innovations, which would facilitate the launch of products and services on the market. International financial institutions must also be enlisted.

We need anchor companies with an ability to take care of major projects and acquire subcontractors. Their finances and funding must be in order. To obtain funding channels, guarantee financing and investment capital, companies need tools and channels. Larger associations can help in the management of this issue.

A system for accessing and sharing information must be developed and harmonised also from the viewpoint of funding application. Sales and marketing must be long-standing and continuous because it takes time to achieve results. The Finnish government should be more involved in the promotion of sales and business. The buyers do not come to Finland, you have to go where the demand is. This requires a concrete operating model drawn up in cooperation with businesses, administration and political decision-makers. For example, Finpro has gained good results in Norway with meeting trips tailored to small groups where only a representative of Finpro or the embassy has accompanied the business group.

In Russia, the problem is the decline in funding. Companies no longer receive funding from the banks. The state has the same financing concern and therefore Russia will probably have to intervene in income taxation. This is a significant issue not only for individual citizens, but also in the structural and business sense.

RECOMMENDATIONS

- The Confederation of Finnish Industries (EK) should initiate investigation on launching a common business strategy for the Nordic business sector to define common interests and targets. This includes commercial and industrial cooperation between Nordic businesses in infrastructure, construction and tourism.
- The Confederation of Finnish Industries (EK) should initiate a sector analysis to promote business activities in northern areas together with the business sectors and enterprises. It must be examined what can be done together and which common issues strengthen the interest and competitiveness of businesses. Creating a common brand for Nordic construction and expertise would help in the marketing efforts. The Nordic Work Model could even bring work back from Asia.
- Nordic energy cooperation should be developed as a priority project.
- Finland must be built into a hub of global data traffic, data storage and big data business. This must be raised as a national strategy that also combines different administrative sectors. This requires, e.g. the following measures:
  - implementation of cable projects in the Baltic Sea and the Northeast Passage
  - ensuring our position at the cutting edge of technologies and infrastructure promoting digitalisation
  - legislation that supports this target, e.g. concerning network security
  - ensuring favourably priced energy for the growth of data centre investments
  - implementation of a service channel (development of public/private cooperation)
  - enhancing big data expertise and developing big data services
- Swedish language skills provide a competitive edge for Finland in the Nordic labour market and business life. The Swedish language is a self-evident basic skill in the Nordic countries, and it can be easily activated on the basis of school Swedish. Other language skills are also needed especially in sectors with stringent security requirements. Knowledge of Russian is important in the tourism industry. Language studies must be activated as part of regular training activities by companies.
- The Finnish government must take measures to strengthen Swedish language skills, e.g. by starting Swedish lessons earlier in the comprehensive school. The government must investigate the reasons for poorer language skills of pupils and launch measures to improve the quality and quantity of language teaching.
- Public/private projects could be major projects that comply with sustainable development and take the sensitive Arctic environment into consideration. Key projects, where the public and private interest in investments meets, must be agreed on for the main sectors and promoted together with the state. Measures are also needed for reforming public procurement practices (total cost of ownership).
- Simplification of permit processes must be investigated together with the state, industry and organisations. The development programme for this must be implemented rapidly.
- Finnish industry is interested in oil spill prevention and environmental cleaning projects in North Finland and north-west Russia. There are good references in the export of environmental technology, such as Kemira's technology and equipment at the water treatment plants in St Petersburg. The cleaning of the coastal area of the Arctic Ocean is carried out along the Northeast Passage. Finnish companies have expertise in the cleaning of contaminated soil, and we must investigate opportunities to take part in the development of environmental technology in the Barents Region and the cleaning of coastal areas in Russia (e.g. Kemira, Lamor, Econet Group, Ramboll Finland, Storvik, Northern Dimension NDEP).
- Tourism is also related to logistics and the way it can be harnessed to support the entire northern economy, the Northern Finland programme, regional and urban areas, the Barents region, the mining industry, and tourism. Important projects to investigate include the development of road and air connections to and within the region.
- The indigenous peoples must be taken into consideration and they must be able to enjoy the economic benefits.
- Finnish cold-related expertise in the clothing sector has a significant potential in relation to Arctic research and the marketing of products in particularly cold conditions. This is a global market area. Finnish research and clothes manufacture in this area are highly advanced. For example, Sievin Jalkine delivers weatherproof, anti-slip footwear to oil rigs.
- The EU is needed in the funding of northern infrastructure projects. EU funding of projects must be promoted in cooperation between Finland, Sweden, Denmark, Norway and also the Baltic countries. Utilisation of the Norwegian pension fund in connection with these projects must be investigated.

5 Infrastructure: networks on land, at sea and in the air

In northern regions, distances are long, traffic volumes are low and the transport network is not integrated and does not meet modern standards. Therefore, a new transport network is needed there, taking account of and developing the existing network and having regard to the development of border crossing points. The transport network also includes a high-quality transport connection from Finland to a port along the Arctic Ocean coast.

Air connections, railways, roads and channels of information technology must be opened in the northern regions. The channels must be made secure to serve both business and society more widely. In terms of security of supply, it is important to build an alternative transport route to the Baltic Sea.

The state is a necessary actor in winning and implementing road and rail network investments in the northern region. Projects in the TEN core network focus on southern Finland. Serious attention must be paid to the building of networks with EU classification. The issue is about preparedness and building a platform for future projects.

When deciding on the transport infrastructure, its importance to all construction and the resulting 'second wave' with its services must be taken into consideration. The potential to businesses created by the future connection when the infrastructure produces new growth must also be understood. Therefore, it is important that the business sector presents clear priorities to the authorities when planning the projects, taking the overall benefit to entrepreneurship and society into account.

Rail and road projects are not carried out without the necessary traffic. The Finnish Transport Agency is investigating the criteria for future projects. Inputs for planning and implementation can be gained with the Northern Dimension Partnership for Transport and Logistics (NDPTL), utilising existing structures.

Road and rail network

Finland's core transport network is expected to be finished by 2030 when the Ostrobothnian railway, highway 4 and the Naantali-Vaalimaa motorway are completed. The next major projects must be aimed at the north with the TEN network. The review of the TEN transport network in 2023 is an important milestone. We must prepare for it and contribute to it already today. We must carry out cooperation with Sweden in relation to the next project preparation.

Improvement of the road network in the near future is of primary importance. Improvement of the VT4 and VT21 corridors and smooth connections for heavy traffic to the ports along the Gulf of Bothnia are also important. New railway lines to the Arctic Ocean are on the long-term agenda and require sufficient transport volumes before they can be implemented.

Long-term planning is needed for the construction of transport corridors, taking account of the safety and competitiveness requirements. The logistical centres of southern Finland have an impact on the entire country. The Helsinki-Vantaa airport and arrangements of the main railway line are the most important ones of these. The transport plan must be drawn up in partnership with the business sector. The maintenance of and investment in the transport network require additional funding of about EUR 300 million each year for the next five years.

In Norway, there are great business opportunities in which Finnish

Core networks in EU transport (rail transport)

TEN networks (Trans-European Networks) are an EU-wide core network corridors with a purpose of connecting EU member states to each other and that way enabling the internal market.

Source: European Commission

companies can also take part. This requires building of new transport and social infrastructure. Finnish expertise and know-how is needed in the building of internal connections in northern Norway. The Norwegian government is prepared to contribute to connections between our countries, but it needs initiative from Finland. This matter is of urgent nature, and the Finnish government must take the initiative.

Three options for the Norwegian rail link

There are three options for the rail link from northern Norway to Finland. A rail link to Kirkenes or via Skibotn to Tromsø would be built with the Finnish track gauge to connect directly to the Finnish railway network. The Tromsø and Kirkenes link would serve at least the mining industry, fishing, LNG transport, and tourism.

A third option is to utilise the Swedish mine railway from the Bothnian Bay ports to Narvik. In the Narvik option, Finland should electrify the track to Tornio and Haparanda and build a track gauge interchange station on the border. This model would include the option of building a link between Kolari and Svappavaara. The Narvik track, which is part of the EU core network, is currently mainly serving the LKAB mining industry. As a temporary measure, LKAB is investing in increasing the capacity of the port of Luleå as the current capacity of the Iron Ore Line and the port of Narvik is not sufficient.

Sweden and Norway are currently preparing the dualling of the railway line, and the port of Narvik in Norway is being expanded. These will significantly increase the railway capacity.

This is an existing rail connection, and its potential use must be investigated together with Norway and Sweden. The Narvik rail link could be utilised with the fastest schedule, and it has the lowest relative costs.

It is essential to study which support measures are needed, what the transport capacity need is and which of the lines would best serve the security of supply and different economic sectors. In Norway, it is also a question of regional policy, and there is also a strong regional lobbying going on in Finland on behalf of different options. A comprehensive study is needed of all three projects between Finland, Sweden and Norway.

As concrete measures, Norway has also mentioned the subsequent monitoring of the Barents transport plan. Norway has proposed drawing up a development strategy concerning cross-border links.

Current transport network

- European route
- main road network
- railway network
- winter ports
- airports (number of domestic passengers over 70,000/year)
- border crossing points by car
- border crossing points by train
- border crossing points by car/train

Transport networks of other countries

- European route
- railway
- port
- airport

Source: Finnish Transport Agency

When talking about the public/private projects in the Barents region, it is necessary to assess the sources of income for the projects, and the corridors must have several users. The Barents transport plan indicates that Finland is at the heart of the issue. Finland has widest industrial use both in and out of the region. Sweden would benefit from the transport of mining products.

Finland and Norway are the main beneficiaries, and both countries have a clear need to develop the transport network in the region.

LNG transportation by road especially from Kirkenes and the Tromsø area is possible, but it would require significant improvement of road connections. With Tromsø, it would mean the improvement of the E8 and E4 roads and, with respect to Sodankylä-Kirkenes, the improvement of the E75 or E6 roads. Some visions have also considered transportation of LNG by railway from Kirkenes for the needs of the Finnish and Swedish industry and even to Central Europe (Tschudi AS).

States and business sectors must agree on TEN priorities

The governments of the three countries must have a common position on which northern railway and road options to push into the next TEN programme of the EU together with the business sector. Nordic cooperation of the project preparation must take account of transport hubs, as well as industrial and commercial factors in different sectors.

The Finnish Transport Agency shall outline TEN network planning and draw up a plan, a schedule and a roadmap. It also acts in cooperation with the Swedish, Norwegian and Russian administrative authorities. The plan shall also take the Green Corridor of the Bothnian Arc into consideration.

Case by case, it has been assumed that the business sector will contribute to the building costs. The cost benefit of railway versus

Source: Arctic Centre, University of Lapland, Prime Minister's Office, Ministry for Foreign Affairs

road link must be calculated in the transport network, taking the transport volumes and number of users into consideration. The transport volumes of Sokli supported the construction of a road link. It must be kept in mind that you cannot build a railway without a road. Taking the transport volumes into account, the ports of the Bothnian Bay are an optimal direction of transport. The current transport volumes alone are not enough for building a rail connection, but if another economic activity, from tourism to industry, is taken into account in the planning of the railway, it can also make the railway profitable.

Funding is raised from European and Nordic investment banks and pooled from EU funds through the Northern Dimension Partnership for Transport and Logistics (NDPTL) support fund. The resources of the fund are directed to a major infrastructure project in the northern area. This project must be promoted in relation to Arctic cooperation.

Air transport

Air transport is central to a functioning transport network and part of the community structure. Air transport is needed due to accessibility and competitiveness, and the commercial development of an area. Movement of labour is essential in an area with long distances and difficult conditions.

There are good flight connections from northern Norway to Oslo, in Finland from Helsinki to Oulu, and in Sweden from Stockholm to Luleå. There are no transport links in the east-west direction. A link between Oulu, Luleå and Tromsø is currently tested, and Finnair operates a scheduled service between Helsinki and Tromsø three times a week during the winter season.

The basic users of air transport in the northern areas are the energy industry, tourism, fishing and mining operations. Of these, energy and tourism make most use of the services. They need direct flights, good prices and decent road connections.

According to Norwegian estimates, the volume of air transport in the country will double in the next decade. Avinor (Norwegian counterpart of Finavia) is investing in air transport in the Finnmark region, seeking increased capacity with direct flights from Europe, USA and Asia. Avinor wants to create an Euro-Arctic hub in Tromsø or Bodø. The planned growth in air transport capacity in Finnmark also means investing in new infrastructure. This may open good opportunities to Finnish construction industry.

Airlines operating in Finland must be aware of this because volumes in the northern region are growing. Finland provides an important feeder service for Asian passengers and cargo, and it must carry on doing so. For example, the fishing and mariculture industries in northern Norway are growing strongly. Helsinki has become a key hub for Norwegian fish exports. The fish is transported by lorry to Helsinki, and from there it continues to Asia as Finnair cargo. Norway needs Finland as part of the logistics chain for its fish processing industry.

Cooperation between Finnish and Norwegian operators offering air transport services is needed in the management of both cargo and passenger transport.

In terms of Russia, we must take account of the border crossing points, such as Salla and Imatra, as well as Vartius, which has a connection to the White Sea.

The coverage and functioning of data communication links must be promoted. This will help the movement of labour and businesses across borders in the region, which also serves the needs of tourism. Tourism also benefits from transport network projects.

Shipping

The business potential of northern maritime shipping lanes grows when the ice cover melts, enabling more extensive sea transport. Sixty per cent of the world's icebreakers have been built in Finland.

The very small icebreaking capacity of the North American continent provides an opportunity for Finnish shipbuilding. Only one of the three icebreakers in the United States is capable of operating in the Arctic regions. Canada has decided on investments worth about 30 billion Canadian dollars in the development of its maritime industry, including patrol vessels and an Arctic icebreaker. Russia will need several ice-going vessels, especially LNG tankers, in the next few decades. These are being built in South Korea using Finnish maritime subcontracting. The plans are currently hampered by the sanctions against Russia. There is also great need for icebreakers and support, maintenance and ice-going vessels in Norway, USA, Canada and Greenland.

There is demand for Finnish Arctic shipbuilding expertise. Drilling platforms need icebreakers to support their operations. It is estimated that the operations of several oil drilling platforms may be started in the Arctic regions during the next ten years when the production costs become profitable and the activities are relaunched. The building of oil and gas fields and other infrastructure and energy transportation will offer prospects to the Finnish maritime industry.

Arctia Shipping Oy has good potential, and its services are not affected by the sanctions. However, US legislation prevents ordering icebreakers from abroad. The icebreakers of Arctia Shipping Oy have carried out icebreaking and maintenance tasks in Greenland, USA and Norway. Norway is its largest partner and area of operations. Canada, on the other hand, is an area for future focus. Shipping is important for Canada, and it wants to develop the utilisation of natural resources. Neste Oil's trade to Canada is growing, especially the export of liquid fuels to Arctic regions. Neste has solid experience in the use of renewable technology, and it is an expert in environmental safety.

When using Finnish icebreakers in other regions, it must be taken into consideration that in the winter season they are used for safe-guarding Finnish shipping operations.

Political criticism by environmental organisations is strong. Finnish technology in this industry is the cleanest in the world, and it is in the interests of the sensitive Arctic environment that the best and cleanest technology is used in the Arctic regions.

Northeast Passage

The opening of the Northeast Passage for commercial shipping has been slow, but the countries interested in the opportunities offered by the route include especially Russia, Japan, South Korea, and China. Russia is more willing to take part in the development cooperation of the route than before.

As a rule, traffic in the Northeast Passage is inland transport within Russia, as well as test and research transport. Russian transport consists of shipping of fossil fuels between Russian ports. From Finland, ESL Shipping has operated regularly along the route. Two tankers of Neste Oil have sailed through the passage to test the route. The first Norwegian LNG tanker sailed through the passage in the last sailing season. In 2014, the volume of traffic decreased due to difficult ice conditions and the political situation. The Northeast Passage is part of the Russian waters and ruled by eastern regulations, and transport takes place with the assistance of Russian nuclear icebreakers.

Short season, shallow waters and the price pose a challenge

The challenge of the Northeast Passage is its short sailing season. The eastern part of the passage is in use only in the summer months. In the winter season, it is not possible to move in the eastern section without the constant help of icebreakers. Transport from the west all the way to Yamal has taken place around the year.

Time poses another problem. Cargo tied to a strict schedule is not suitable for the route due to the uncertain conditions, which may slow down the transport times. The ships sail in convoys, and they always need to be escorted by at least two icebreakers.

The size of the ships and, consequently, their economic efficiency is diminished by the shallow waters on the Siberian coast, which makes it impossible to use large ships. Furthermore, large container ships are wider than icebreakers, which limits their use.

The low cost of international freight has been regarded as an obstacle to the use of the Northeast Passage. With current tariffs, it is cheaper to go from Europe to Asia via Africa than use the Northeast Passage. The Russians have also increased the shipping route fees. It is estimated that the current tariffs do not even cover the costs of Russian nuclear icebreakers. When international freight tariffs rise, the Northeast Passage may become a profitable transport route. However, Russia as well as many Asian countries, especially China, Japan and South Korea, are interested in using the route.

Need for Finnish expertise

There is still a lot to investigate in the use of the Northeast Passage, such as rescue and oil spill prevention problems, the lack of deep-water ports, poor coverage of the communication system, and the low standard of weather and icebreaking services. Their inadequacy has an adverse effect on the use of the passage. Furthermore, the shallowness of the passage causes navigation problems in special situations. Finnish expertise would present an excellent commercial opportunity to create a communication system in the Northeast Passage and Arctic sea areas.

The passage also needs actions related to maritime safety. These actions will also help to organise search and rescue (SAR) services, which are found to be insufficient along the Northeast Passage.

Squabbling between countries over the interpretation of international maritime law in the Arctic waters generates uncertainty and diminishes the benefits. Russia and the West have had differing interpretations of the freedom of navigation, international maritime territory and territorial waters in the Northeast Passage. There has been some convergence in the past few years, too, especially before the crisis in Ukraine. Russia has strengthened its bases along the Northeast Passage, especially on its eastern side. The purpose of this is to safeguard energy sources and their logistics on the one hand and to monitor traffic in the Northeast Passage on the other hand.

According to the estimates of commercial actors (Maersk, Neste Oil, Arctia Shipping) the route could be economically viable in about 20 years taking the above risks into account, but these uncertainties and their development will determine whether it will be beneficial to use the Northeast Passage in the next few decades.

In relation to the Northeast Passage, Finland has the best knowledge of navigation and ice transport. Finland has an advantage especially

Freight volumes in the Northeast Passage

Total traffic (thousand tonnes)

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1695	1718	2023	1956	2130	2219	1801	2082	3111	3752	3914

Transit traffic (thousand tonnes)

2010	2011	2012	2013	2014
110	820	1260	1176	274

Source: NSRA, NSRIO, CNIIMF, Kiiski 2015

over Russia in relation to Arctia Shipping's ice expertise. Finnish multipurpose icebreakers can also carry out other tasks, such as oil spill prevention, laying of cables, fire protection, and evacuation. Russian icebreakers have provided healthcare services for villages along the coast. Icebreakers must also have helicopter preparedness. These are necessary preconditions for operating along the Northeast Passage.

The Finnish and Swedish authorities have developed ice class regulations and maritime safety, which includes sea traffic control and ice navigation (Finnish Transport Agency). Finland also has know-how in producing weather and ice reports. The Finnish Meteorological Institute would have an opportunity to improve and expand the weather and ice reports over the entire Northeast Passage. Combining the services of the Finnish Meteorological Institute with navigation, maritime training and pilotage services would achieve a functioning commercial entity for the needs of the Northeast Passage. If we do not take up these opportunities, someone else will.

Finland has know-how in environmental protection and oil spill prevention. New energy exploration areas are located on the frost line or in icy regions. There is a lack of oil spill prevention technology for icy conditions. The Finnish company Lamor (Larsen Marine Oil Recovery) is among the best in the world in this field.

RECOMMENDATIONS

- Many projects are based on the transport infrastructure of the Northeast Passage and the Arctic Ocean railway, and therefore it is important to carry out a revision of the TEN network in 2023. The next TEN network revision by the EU must be prepared for and influenced already now. The Finnish government must first draw up its own plan on preparing for the next round of financing. We need a government proposal on drawing up a review and on the optimal direction for Finland. After that, the Finnish, Swedish and Norwegian governments must submit a joint political position stating which of the northern railway or road options is to be developed and pursued for the next TEN programme. The Finnish and Norwegian priorities in relation to the Kirkenes and Tromsø links must be investigated as a separate matter.
- Finland needs an Atlantic connection due to security of supply and to gain an alternative transport route in addition to the Baltic Sea. This is a matter of safety requirements and the creation of a key northern transport passage that serves all lines of business.
- Northern transport issues must be addressed by high-level EU working groups. The opportunities of the Northern Dimension Partnership for Transport and Logistics (NDPTL) must be identified and its role must be strengthened. The Finnish Transport Agency shall draw up a road map.
- The needs for building a road network must be determined taking account of mining projects, industry and tourism. The synergy advantages of different business sectors must be identified. The state must have a clear message to industry on the management of transport issues. The primary target must be a functioning road connection to northern Norway and the Arctic Ocean by improving route E8. In the near future, VT4 and VT21 take priority in the improvement of the Finnish road network.
- The existing Barents transport plan must be updated in order to implement the projects. We have a common goal: a development plan including all forms of transport for the Barents region. This work is closely related to the Barents Freeway project funded by Kolarctic.
- Finland must offer ice management services, icebreaking, construction of infrastructure, and creation of transport control systems for the Northeast Passage (e.g. Arctia Shipping, Finnish Meteorological Institute, Trafi, educational establishments, construction industry). The development of the use of the Northeast Passage must be monitored from the physical (climate) and geopolitical (international politics) viewpoints.
- In northern sea routes, attention must be paid to the development of search and rescue services, oil spill prevention, impacts on fishing, and environmental impact assessment, as well as the weather and ice information service for shipping. These issues should be agreed on between the states and actors. Finland has expertise in these areas. Finland must pursue to maintain its leading market position in the building of icebreakers and promote the recognition of its expertise in the field.
- The Helsinki-Vantaa Airport and the northern network of airports must be vigorously developed. The flight connection between Helsinki and Tromsø must be examined from the viewpoint of business and tourism in Lapland, also taking into consideration the development of an east-west connection in northern areas. The flight connection experiment between Oulu, Luleå and Tromsø must be continued. Organising a direct flight connection to Russia would serve industry, tourism and Arctic university cooperation.

6 Arctic training and research

There is a great need for Arctic knowledge, training and research in the northern areas. Cooperation and networking between universities and educational establishments in the Arctic region are needed because the gamut of research is broad in terms of contents and standards. The use of resources must be optimised. Research and training must generate expertise, growth and business operations.

Universities must be engaged in cooperation in Finland and in the international scale. Cooperation between universities and the business sector must also be reinforced. We must know what others are doing and, based on that, we must identify the possibilities of removing overlapping functions and gathering resources. Cooperation includes structural development of universities, specialising in Arctic subjects and increasing expertise.

Division of labour and cooperation between the University of Lapland and the University of Oulu must be developed with an objective of one Arctic university, the resources of which can compete with, e.g. the University of Tromsø. We must aim for an internationally attractive and appealing ecosystem of Arctic know-how, which combines the researchers, teachers and students and industry representatives of the universities and research institutes.

The task of the Ministry of Education and Culture and the Academy of Finland is to promote the profiling of Finnish universities and their ability to find their own strengths. This is essential in Arctic expertise.

In addition to universities, we must also continue goal-oriented profiling of universities of applied sciences and improving the efficiency of their operations. Universities of applied sciences have extensive practical expertise and research and development activities especially in sectors that serve businesses. The working-life orientation of universities of applied sciences and their cooperation especially with SMEs that have Arctic expertise must be strengthened further.

On the international scale, the network of universities in the Arctic region must be developed in order to strengthen cooperation between universities. There is cooperation between the universities of northern Finland and, e.g., the universities of Tromsø, Luleå, Fairbanks, Archangel and Moscow. Established cooperation between the University of Archangel and the University of Eastern Finland must be deepened. We are currently seeking more partners especially in Russia. In addition to the universities of Arctic regions, cooperation must be extended, e.g. with China and Japan. Norway is investing strongly in Arctic research with particular focus on the University of Tromsø.

Academy of Finland

The Ministry of Education and Culture is the main coordinator and principal actor in Finland's Arctic research. The ministry must review the division of labour and responsibility concerning Arctic research in Finnish universities and allocate resources for research work for each research field and university in cooperation with the Academy of Finland. The Ministry of Employment and the Economy is the lead coordinator in development processes related to the business sector.

The Academy of Finland supervises, decides on the allocation of research and development resources, and coordinates research resources to optimise their use. In the area of Arctic expertise, public research and innovation resources should be directed especially to industry-driven strategic research. The Arctic resources of the Academy of Finland must be strengthened. The Arctic must be one of the focus areas in the strategic research agenda of the next government.

Expertise-based growth requires broader coordination between the Academy of Finland, Tekes and VTT Technical Research Centre of Finland, and top management of universities that specialise in Arctic expertise. This need has grown because we keep facing increasingly complicated challenges more often than before. The principal role of research in the generation of expertise-based growth is to produce activities and experts. Operations in Arctic issues are an example of a field that allows striving for competence-based growth, but requires particularly good coordination both nationally and internationally.

Arctic condition expertise, both technical and cultural, is a key element in many issues related to the functioning of society. Sustainable utilisation of natural resources requires a solid multidisciplinary knowledge base, and identification and prevention of risks. Finland has Arctic expertise in both the scientific and business sectors. We must ensure and further strengthen a broad-based knowledge base of expertise in terms of both fundamental and applied research.

Arctic research and its funding must be of high quality, sustained and significant. Research programmes must be undertaken with a longer perspective than at present (e.g. 10 years). That way they could be built out of modules of different lengths and funding volumes. This would also increase flexibility to also enable rapid reaction to new, unforeseen needs, if necessary. Increasing the knowledge base strengthens Finland's standing as a world-class leader of Arctic excellence and a sought-after partner.

National-level top expertise in research and business operations is a basic requirement when seeking cooperation with the leading researchers and business sector of other countries. Attention must also be paid to the development of basic and specialist language skills at all levels of education.

Tekes

Tekes is the Finnish Funding Agency for Technology and Innovation. Tekes's area of strategic research is Arctic resources with a focus on cold-related expertise and the natural resources of the sea. Reducing emissions from maritime transport is also on the agenda.

Cooperation is carried out with the Academy of Finland and the Ministry of Employment and the Economy. Tekes is currently running a programme of EUR 100 million that helps, inspires and activates to seek EU funding for projects. One example of this is the Martek programme in which Norway is also involved. Nordic partnership is sought for the projects.

There is funding available for the utilisation of natural resources, and subsea countries outside the Arctic region are also interested, but the Arctic market is found to be remote. Therefore the Arctic opportunity must be promoted.

The Arctic market and applications must be expanded to a global level as global technology is of interest. If we are experts of Arctic knowledge, we can also be actors in the field. We need top-quality expertise. Research must result in business operations.

Tekes's focus areas are ICT, cleantech, energy efficiency, maritime industries and transport, and offshore activities (including construction). The key themes of the maritime industry are cleantech and safety. Tekes's themes for 2015 include emissions reduction, ICT technology, data projects, oil spill prevention, and business potential. The next Tekes programme that will be launched in late 2015 concerns Arctic excellence. It includes identification of the knowledge base, international agreements, the value of operations to businesses, utilisation of knowledge in industry and research institutes, internationality, and project results.

The problems include poor demand and slow start-up. Many countries have been interested in EU's Horizon 2020 programme (EUR 70 billion). We now need programmes that take the needs of business into consideration. Tekes is able to promote these. Tekes's new instruments enable allocation of resources for the preparation of major Horizon 2020 projects that are important to Finland.

Finland has the Black Carbon project that includes VTT, the Aalto University, Tampere University of Technology and the Finnish Meteorological Institute. This could be an interesting common theme of the Arctic Council together with the USA. Cleaning of oily water is also on USA's agenda, which could also be a common theme with Finland. Finnish companies have solid expertise in this field.

Norway dominates the field of international research as a whole. Then comes the EU. Russia is interesting, but cooperation is difficult in the current situation. At the Nordic level, the number of research cooperation projects and target market projects has increased.

Understanding the customer, market and earnings model poses a challenge to Arctic activities. Finnish competitive edge and expertise must be given prominence.

Arctic university as a goal

The University of Oulu, the University of Lapland and VTT play a key part. Their resources must be pooled and their division of labour and profiles must be sharpened. At least their management should be under the same supervision in Arctic issues, e.g. within the scope of a common research council.

Finnish universities call for structural development and, above all, profiling. In the last few years, structural development has been given a strong emphasis, e.g. in Denmark, Norway and also in Russia. Norway established the Arctic University of Norway based on the University of Tromsø and some regional universities. Correspondingly, the Northern (Arctic) Federal University (NARFU) was established in Archangel in Russia by combining a few universities and units. Both Norway and Russia are seeking an even stronger role in Arctic expertise with these structural developments.

The University of Lapland and the University of Oulu both have a profile focusing strongly on Arctic expertise. The disciplinary fields of the universities do not overlap each other in the main (only pedagogy is taught in both of them). The Ministry of Education and Culture has requested a report from them on their mutual cooperation. There have also been proposals for establishing a common research council or a similar coordination body, and drawing up a joint research programme.

For example, a joint research programme and advisory board have been suggested when discussing the matter of strengthening cooperation between the universities. The rectors of the universities consult with one another a couple of times a year. This kind of cooperation has been carried out for years.

With reference to the structural solutions in Norway and Russia, combining the universities of Oulu and Lapland must be set as a goal in order to create an Arctic university in Finland alongside the Tromsø and Archangel universities. The pros and cons of this solution should be thoroughly investigated especially as Arctic research and training in Finland are fragmented and dispersed in small units.

The many research and business projects of northern universities cover the entire country and do not only concern actors in the Oulu region or in Lapland. The problem is how to distribute information to actors in the rest of the country. Cooperation between universities in the northern regions is very important to the Finnish business sector, research and projects.

University of Oulu

The University of Oulu and the City of Oulu have extensive technological and technical expertise. The university has ten faculties, and the city has 600 high-tech companies, 10,000 employees in the field and 200 international companies. Areas of expertise that must be invested in are radio technology and communications, rescue services, Arctic oil spill prevention, energy efficiency, and ice-related

expertise (winter navigation and weather and ice reports). Other extremely important competence areas include cold-related expertise, the environment and natural resources.

Mineral extraction, the environment and bioeconomy are under a single umbrella of Arctic strategy in the University of Oulu. The Mining School the only university-level unit of its field in Europe, albeit it is difficult to find people with the required qualifications in this field.

Arctic Centre of the University of Lapland

The Arctic Centre of the University of Lapland is an expert institution in Arctic issues. The Global Change Research Group studies ecology and environmental changes. The Sustainable Development Research Group examines how societies and communities adapt to change. The Northern Institute of Environmental and Minority Law specialises in human rights and environmental issues. The University of Lapland also carries out research in tourism, which is important for the region.

The Arctic Centre provides information related to the Arctic and Barents regions and the northern policy on a wider scale. Basic information about Finland's Arctic policy, research and economy is available on the ArcticFinland portal.

The Arctic Centre has resources for cooperation with enterprises. These are divided into research groups (global change, sustainable development, Arctic anthropology, and the Northern Institute for Environmental and Minority Law), the Science Centre and the Science Communications. Multidisciplinarity and the multi-level combination of Arctic knowledge also serve companies.

From the point of view of enterprises, one of the specialist areas of the Arctic Centre is impact assessment in the Arctic region. Two projects in the field were completed in 2014. One was a strategic assessment of change in the Arctic region, funded by the European Commission, which gathered the views of researchers and local interest groups in one report. A total of 19 European expert institutes in Arctic issues took part in the work.

The Arctic Centre is running a Tekes-funded project that investigates the views of companies and environmental consultants on environmental impact assessment (EIA), e.g. as a tool for implementing corporate social responsibility. The companies taking part in this project are Lapin Vesitutkimus; Arctia Shipping; Sito; Kemijoki; Ylläksen Matkailuyhdistys; Levi Tourist Office; Northland Mines; Agnico Eagle Finland; Kittilä Mine; the Centre for Economic Development, Transport and the Environment; and Tunturi-Lapin Kehitys. The results of the project will be published in book format. A report on EIA procedures in the Arctic regions of Finland and Russia has also been drawn up.

Finland on its own and together with the other Nordic countries must prioritise any research projects eligible for funding from EU's investment and other funds and research programmes. The decision on funded projects is taken by a panel of experts. Examples of these are electricity and low temperature research, as well as cold energy storage (Fortum).

Export and marketing of technological knowledge must also be long-standing and continuous. It takes time to achieve results. The Finnish government should be more involved in the promotion of technology sales and business.

There are many Finnish technology companies that operate as subcontractors to supply parts and equipment for satellite systems, in polar and northern regions (ESA). Finnish expertise also includes land signal equipment, radars and telecommunications. The EU's Horizon 2020 programme has been established to promote these kinds of projects.

Case: Arctic Marine Testing, Training and Research Centre (ArcMaTe)

A study co-financed by the Ministry of Transport and Communications, the Ministry of Employment and the Economy and the Ministry of the Environment proposed the establishment of an international Arctic Marine Testing, Training and Research Centre, ArcMaTe) on the coast of the Bothnian Bay. The centre will be implemented by the cities of Kemi, Oulu and Pori together with their development companies.

Norway's Arctic centre of competence, which is under construction in Svalbard, and Finland's ArcMaTe centre will complement each other, creating a unique and significant Finnish-Norwegian Arctic centre of excellence.

The ArcMaTe centre will offer training, testing and standardisation related to safe winter navigation, rescue operations and oil spill prevention. There is a demand for these especially in the oil and gas industry and from companies and countries operating in the Arctic regions (e.g. shipping, logistics, environmental protection).

If a broad-based centre of excellence proves to be commercially viable, the centre will be opened by the end of the decade. This also provides a business opportunity: enterprises, universities and ArcMaTe could cooperate in offering projects for businesses in the field.

Case: Aboa Mare

Navigation in Arctic waters is challenging. In addition to Finland, only Canada and Russia have extensive experience in Arctic navigation. Finland has the highest level of technical expertise in basic information.

Finland has strong expertise in training simulation. Aboa Mare develops simulation equipment in cooperation with shipping companies and practices navigation in different conditions and routes with simulators. In addition to shipping companies, Wärtsilä and Aker Arctic are also involved in these activities.

Training must be performed in authentic conditions and in Ice Training simulators. This can also be combined with an open platform project that allows connection of various programs and equipment to the basic platform with a purpose of creating a virtual ship applied to different conditions. The Ice Training simulator is an export product for Arctic navigation.

Finnish Institute of Occupational Health

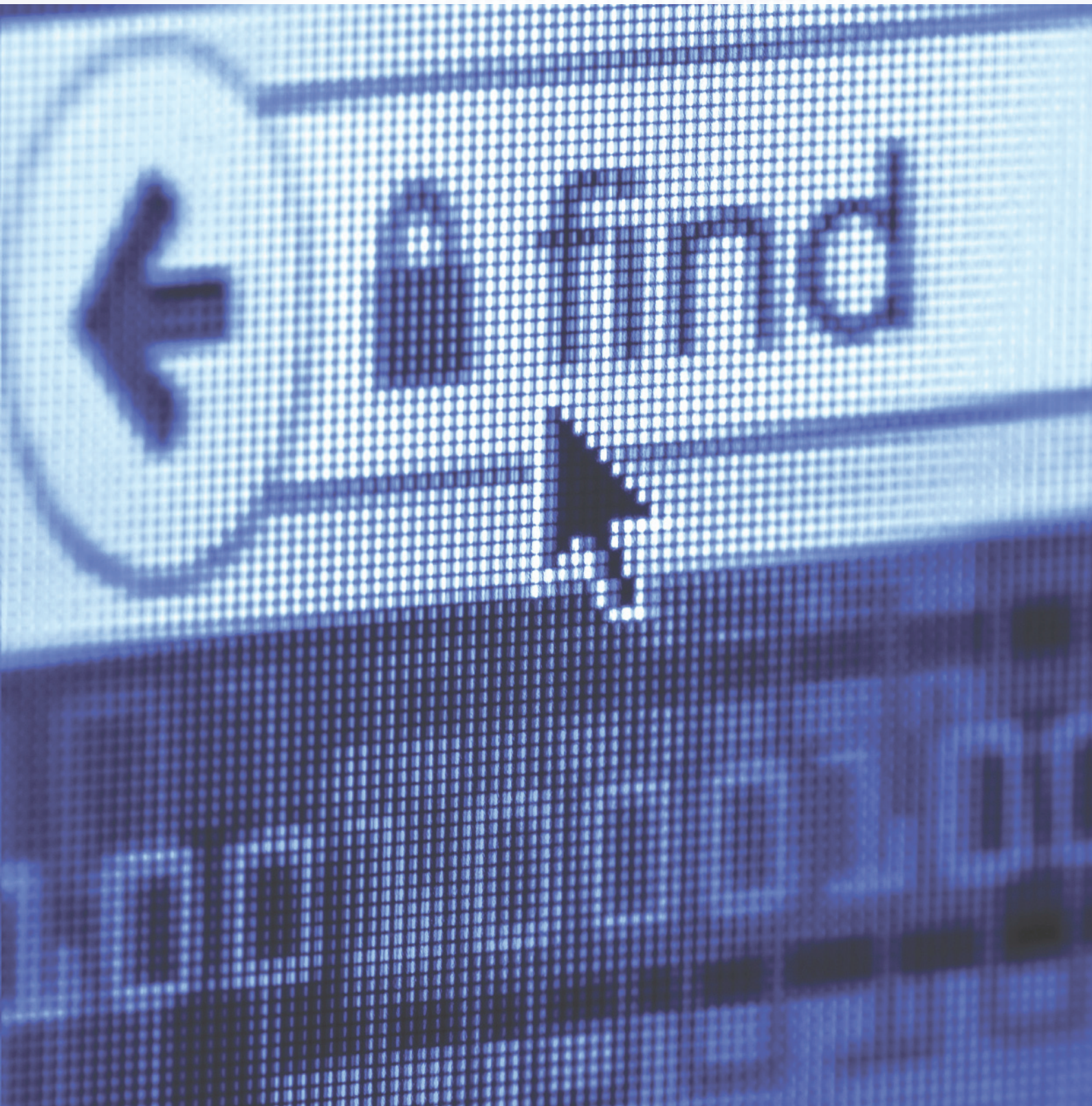
The Finnish Institute of Occupational Health carries out diverse research on cold working conditions. Arctic research is part of the strategy of the institute. This research produces marketable products, for example, for oil rigs.

The clothing sector has many opportunities in, e.g. footwear and clothing. Finnish clothing-related cold expertise has significant potential. Arctic research and Finland's cold conditions can be combined. In addition to research, this offers an opportunity for the global market. The Arctic region presents broad business opportunities. Finnish research in this area is highly advanced. For example, Sievin Jalkine delivers footwear to oil rigs and Kuomiokoski supplies Kuoma shoes and boots suitable for winter use. They are weatherproof and slip resistant.

RECOMMENDATIONS

- It is important to manage entities in the funding of Arctic research. The Academy of Finland, universities and Tekes play a key role. Possibilities of utilising EU funds and the planned EU investment fund must be investigated. Universities and research institutes must be able to utilise EU research funding.
- Cooperation between universities in northern Finland must be developed into a single, internationally competitive Arctic university. The universities in northern Finland complement one another, taking into account the faculties of law and humanities in the University of Lapland and the economic-technical and scientific fields of the University of Oulu. The sizeable technological, technical and social expertise of the universities must be utilised at both the international and national level. Finland's Arctic university would combine the strengths and utilisation of resources of both of the northern universities.
- Nordic Arctic universities must establish joint professorships and research and training programmes (e.g. Nordic Mining School).
- Areas of expertise that must be invested in in Arctic research include radio technology and communications, rescue services, Arctic oil spill prevention, cold expertise, energy efficiency and ice-related expertise (winter navigation and weather and ice reports).
- A master's degree-level study programme on Arctic matters must be established. It could include several disciplines: natural sciences, tourism, economic sciences, geology, and the environment. Other fields of research and studies could also be connected to it.
- It is important to develop maritime studies in universities of applied sciences on the basis of existing capacities.
- Cooperation must be carried out with projects of the Norwegian Arktis 2030 funding system. These will promote cross-border cooperation, investment in industry, expertise, development of infrastructure, and the strengthening of environmental protection, security and preparedness. Support can also be applied for projects studying climate change in the polar regions and for projects promoting concrete work by the Arctic Council and the international co-operation carried out in the Antarctic.
- Finnish expertise and products and their marketing need designing and branding. In this respect, Finland is an attractive environment, for example, for Norway.
- Establishment of the EU Arctic information centre must be concluded. The Arctic Centre of the University of Lapland carried out a preparatory evaluation study, but a decision on establishing a permanent information centre will still need to be made. As Norway is not an EU country, the most logical location for the information centre would be Rovaniemi.
- The business sector and the Centres for Economic Development, Transport and the Environment together with universities, universities of applied sciences and other educational establishments must provide advanced language training according to the general language skills and the special requirements of the business sectors. Activation of the Swedish language is a basic requirement and a competitive edge for Finnish actors in relation to countries outside Scandinavia. English language skills in demanding technical sectors and those requiring a particular level of security are often a mandatory requirement in addition to Swedish.

7 Information centre to serve businesses



In 2014, the Lapland Chamber of Commerce commissioned a questionnaire, according to which companies in the northern region traded the most to northern Sweden (69%), northern Norway (39%) and Russia (17%). The most interesting sectors were industry, construction, energy industry, and mining.

The lack of market information was considered by far as the greatest barrier to business. In order to promote business operations, measures related to finding markets, company-specific advice, tailored export promotion measures, and mentoring of companies have been requested above all.

In Finland, there is growing interest in entrepreneurial activities and cooperation in the northern areas. How can this be promoted with communication and how can it be carried out in practical terms? We need a change of attitude, we must see the big picture, we need to organise activities in the north and from the south to the north, avoiding bureaucracy. Different business sectors have different levels of preparedness. That is why we must have experts available for the planning and implementation of operations. In addition to sector-specific information, we need general knowledge and a strategic direction.

The Arctic and northern region is not there just for major companies. In order to win projects, we must gather leading actors of different sectors. These anchor companies that are able to manage large projects will use SMEs for subcontracting of projects. When sectors are focused, the potential enterprises and subcontracting network must be analysed. This requires a team of subcontractors. We need constant, regular cooperation between actors in order to seek leading actors and subcontractors. The finances and funding of the anchor companies must be in order.

In terms of communications, we need regular regional and tailored roadshows to acquire projects and activities. The involved organisations must also be able to access necessary documents in a centralised way in a web service.

For example, the Finnish subsidiary of the Norwegian company Storvik provides corporate advisory services and creates connections to the Norwegian industry, the oil and gas sector, maritime transport, infrastructure construction, the mining industry, and transport projects.

Source: www.barentsinfo.org, Arctic Centre, University of Lapland, Prime Minister's Office, Ministry for Foreign Affairs

Barents Center Finland acts as a coordinator for Barents specialists located in northern Finland (Lapland, Northern Ostrobothnia, Kainuu and Central Ostrobothnia) and markets their services mainly for the business sector. It gathers the competence of the region into a service portfolio on a 'one stop shop' principle. The Barents Center is a non-profit, matchmaking organisation operating as a point of contact between the service provider and the service requester.

The Center acquires, gathers, creates and refines information about the Barents Euro-Arctic Region for the special needs of business, education and administration. It is actively involved in training, research and R&D activities. The Barents Center does not manage or administer projects.

The objectives of the Barents Center are:

- Communication and contact with the Finnish State and promotion of contacts between the Finnish State and the key actors in the Barents Euro-Arctic Region (northern Norway, northern Sweden, northern Finland, north-west Russia).
- Coordination of regional activities related to the Barents region in Finland.
- Increasing the visibility of Finland in the Barents region.
- Developing transport connections in northern Finland and the Barents Euro-Arctic Region.
- Developing the operating conditions of SMEs.

RECOMMENDATIONS

- Creating an official operator for producing information and gathering documents to provide a national up-to-date information service on future and starting projects. These operations must include the whole of Finland. The implementation would be the responsibility of commercial operators. Nationwide operations provide centralised information on projects and necessary advice for enterprises on a 'one stop shop' principle. The arrangement must provide an opportunity for export promotion and presentation events for Finnish companies. The material must be available to companies per sector in a centralised way.
- Continuous monitoring, establishing business potential and presence in the northern areas are important to companies. We need intermediary organisations that have the expertise and direct contacts to the northern areas, to businesses and the authorities.
- To take part in investment, we must create more extensive Finnish and Nordic entities for businesses to join. Finnish demand can be boosted with the creation of consortiums by providing project opportunities through larger entities and clusters.
- In order to win projects, we must involve leading actors of different sectors. We need anchor companies that are able to manage also large projects and employ subcontractors in the projects by focusing on sectors. This includes an analysis of potential anchor companies and the subcontracting network to be created for them. We need constant, regular cooperation in order to seek leading actors and subcontractors.

Published by:
Confederation of Finnish Industries EK
P.O.Box 30 (Eteläranta 10),
00131 Helsinki, Finland
Telephone +358 9 420 20
www.ek.fi

Produced by:
Protagon Consulting Oy

The report is available on the internet:
www.ek.fi/arctic

Layout:
Arja Nyholm, Jumo Oy

March 2015

The report was commissioned by:
Confederation of Finnish Industries EK
Finnish Energy Industries
Finnish Chemical Industry
Finnish Hospitality Association MaRa
Confederation of Finnish Construction Industries RT
Federation of Finnish Technology Industries

Funded by:
TT Foundation